U.S. Department of Homeland Security
United States Coast Guard

Commander
District Eleven

U.S. Coast Guard Island, Bldg 50-2
Alameda, CA 94501-5100
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16590
December 29, 2008

California High-Speed Rail Authority
San Francisco to San Jose
Attn: Dan Leavitt, Deputy Director
925 L Street, STE 1425
Sacramento, CA 95814

Dear Mr. Leavitt:

Please include the Coast Guard Bridge Office concerning the Notice of Intent to Prepare an Environmental Impact Statement (EIS), FR Doc E8-30751 dated December 29, 2008, for the section of the California High-Speed Rail Authority's proposed California High-Speed Train (HST) System, from San Francisco to San Jose, for all bridge related issues over navigable waters of the United States.

The General Bridge Act of 1946 requires that the location and plans for proposed new bridges or alteration of existing bridges over navigable waters of the United States, be approved by the Commandant, U. S. Coast Guard prior to commencing construction.

Coast Guard Bridge permitting is subject to the National Environmental Policy Act (NEPA), and the Coast Guard should be invited to participate as a cooperating agency for NEPA, during the development of the draft environmental document for the project.

Applications for bridge permits should be addressed to Commander, Eleventh Coast Guard District, Bridge Section, Bldg 50-2, Coast Guard Island, Alameda, CA 94501. Applications are available on-line at: http://www.uscg.mil/hq/cg5/cg5411. The application must be supported by sufficient information to permit a thorough assessment of the impact of the bridges and their immediate approaches on navigation and the environment. We recommend discussing the proposed impacts of procedures for constructing, altering or demolishing bridges, in the NEPA document. The NEPA document should also contain data on the number, size and types of vessels using or projected to use the waterway.

#3
Coordination with US Coast Guard re Bridge
#2 Bridges

We appreciate the opportunity to comment on the project in this early stage. You may contact Mr. Carl Hausner by telephone at (510) 437-3515 if additional information is needed.

Sincerely,

DAVID H. SULOUFF
Chief, Bridge Section
Eleventh Coast Guard District
By direction of the District

Copy: USACE, Los Angeles District

F1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

April 6, 2009

David Valenstein
Federal Railroad Administration
1120 Vermont Avenue, NW, MS 20
Washington, D.C. 20590

Subject: Scoping Comments for San Francisco to San Jose Section of the Proposed High-Speed Train System Environmental Impact Statement/Environmental Impact Report

Dear Mr. Valenstein:

The United States Environmental Protection Agency (EPA) has reviewed the Federal Register Notice published December 29, 2008, requesting comments on the Federal Railroad Administration (FRA) and California High Speed Rail Authority (CHSRA) proposal to prepare a joint project Draft Environmental Impact Statement (Draft EIS) and Draft Environmental Impact Report (Draft EIR) for the San Francisco to San Jose section of the Proposed High-Speed Train (HST) System (Project). Our attached comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508) and Section 309 of the Clean Air Act.

We appreciate the close working relationship we have had with FRA and CHSRA as a cooperating agency on the previously completed statewide, programmatic, "Tier 1" EIS completed for an HST for California. We understand that project-level, "Tier 2" EISs have been initiated as a follow-up to the statewide analysis. If properly planned, EPA supports the concept of an HST system in California that can provide an alternative to increasing vehicle miles traveled and lead to reduced environmental impacts. We look forward to continuing our working relationship with you on the Tier 2 EISs and other Tier 2 project-level environmental analyses that will follow.

Through our previous comments on the statewide, programmatic EIS, EPA provided multiple recommendations and concerns to be addressed at the Tier 2 level. EPA also provided detailed comments on the HST Project Environmental Analyses Methodologies on May 14, 2008. Our detailed comments below include these, and other recommendations, related to continued interagency and community coordination, relationship of this Project to other regional transportation projects, land use and transportation linkages, and analysis of impacts to (1) noise, (2) energy resources, (3) air quality, (4) tunneling, (5) environmental justice communities, (6) water resources, (7) biological resources, and (8) invasive species. In addition, we have provided some recommendations for the cumulative impacts and growth inducement analysis for this

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Noise
energy
BIO
Air quality
env justice
Hydro

F2

Project. We also recommend that FRA and CHSRA follow through with the mitigation measure commitments made in the statewide Tier 1 Final Programmatic EIS (see enclosure).

Interagency and Community Coordination

EPA commends the previous efforts of FRA and CHSRA in coordinating with our agency to highlight the potential environmental impacts of an HST system for all of California as outlined in our April 2003 Interagency Memorandum of Understanding (MOU). The MOU outlined a process for integrating the requirements of NEPA and Clean Water Act (CWA) Section 404 to streamline the environmental review process for the statewide "Tier 1" Programmatic Environmental Impact Statement (PEIS), which is now completed.

We understand that the proposed Project, connecting San Francisco to San Jose via HST, is the third project-level, "Tier 2" EIS to be initiated as a follow-up to the statewide analysis. For this, and all upcoming project-level EISs that tier off of the statewide programmatic document, EPA is available to continue to coordinate to discuss potential environmental concerns and solutions at the earliest possible opportunity.

Furthermore, methods to incorporate effective public participation into the NEPA process should be fully described and implemented early to better incorporate public concerns into the planning process. Where potential acquisition of property is proposed, an open, participatory process involving affected residents should be implemented.

Relationship to Regional Transportation Projects

The Draft EIS for the San Francisco to San Jose HST segment should specifically identify how the multiple proposed rail projects in the greater Bay Area relate to this Project. It is our understanding that the Metropolitan Transportation Commission (MTC), Bay Area Rapid Transit (BART), and Caltrain, along with a coalition of rail passenger and freight operators, have prepared a comprehensive Regional Rail Plan for the Bay Area, as required by the voters in the Regional Measure 2 (RM2) Traffic Congestion Relief Program (Final Report on September 26, 2007). EPA is supportive of FRA and CHSRA coordination with local transportation agencies to ensure that the Regional Rail Plan is integrated with the Bay Area to Central Valley HST system.

Coordination with local transportation agencies provides an opportunity to integrate high speed rail with plans for local service. EPA recommends FRA and CHSRA involvement in regional projects in order to minimize duplication of efforts and conflicting transit goals so that potential design, construction, permitting, and mitigation in the area can be streamlined to minimize environmental impacts.

Recommendations:

- Address how the proposed Project will insure that potential duplication of efforts and incompatibilities will not occur.
- Identify integration and/or incompatibility of projects.

- Identify the specific design features of this proposal that are being designed to "link up" with the other transportation, commuting and transit proposals in the region.

- Clarify whether the facilities constructed for the Caltrain Electrification Program were designed to accommodate power distribution requirements for a future HST system. Address how the proposed project will be integrated with the operation of the "Baby Bullet" express service and pedestrian and bicycle access improvements.

Land Use and Transportation Linkage

The Draft EIS should identify all transportation improvements proposed to provide access to the proposed facilities from anticipated key rider groups in the Bay Area and surrounding population centers, including transit connections, new methods to move people while reducing congestion, and increased bus service (express service, increase in service on existing routes, and new routes). The Draft EIS should analyze and disclose the temporary and permanent environmental impacts of constructing stations, parking facilities, maintenance and storage facilities, power propagation infrastructure, and required road developments and modifications. Because the project system is planned along the existing Caltrain corridor, the Draft EIS should describe, in detail, the specific modifications to the existing rail network and rail crossings required to be compatible with an HST system.

The Draft EIS should also demonstrate avoidance and minimization measures to reduce environmental impacts associated with the construction of passenger stations and maintenance facilities, such as multi-level parking structures as opposed to large expansive parking lots. The Draft EIS should identify where proposed stations, parking facilities, and additional required infrastructure will be located in the project corridor, and should disclose the associated impacts from station development on planned and unplanned growth.

Recommendations:

- Describe the expected land use changes associated with station locations.

- Describe the associated environmental impacts of those land use changes, both indirect and cumulative.

- Identify how access to the HST system will be integrated with the existing Caltrain system and describe, in detail, the specific modifications to the existing rail network and rail crossings required to be compatible with an HST system.

- Identify parties responsible for mitigating the environmental impacts associated with the indirect and cumulative impacts of the projected land use changes.

- Identify the timeline for improvements and maintenance.

A substantial benefit of a proposed high speed rail corridor connecting San Francisco to San Jose is the opportunity to provide improved transit services and to reduce vehicle miles

traveled (VMT). EPA strongly supports including project elements that will further reduce VMT.

Recommendations:

- Minimize the number of parking spaces to the greatest extent possible at the station in order to facilitate the use of transit;
- Coordinate with other transit providers to maximize station access by transit;
- Design the new facilities to be pedestrian and bicycle-friendly, in addition to linking with other modes of transit; and
- Support policies that will increase density and mixed-uses in the station areas.

#1 traffic

Noise Impacts

The Draft EIS should address the potential noise and vibration impact to residents, businesses, and wildlife related to the construction and operation of the proposed Project. Potential impacts to human health and welfare and wildlife activity are important with a project of this magnitude, particularly in light of the densely populated area and maximum speed and resulting sounds and vibrations that the HST will produce throughout the train route.

#1 noise.

Recommendations:

- All noise impacts to should be fully analyzed and presented in the Draft EIS. In addition, the Draft EIS should include commitments to implement measures to adequately mitigate noise impacts associated with the Project. The Draft EIS should assess noise and vibration exposure to determine the severity of impacts near the proposed HST route.
- The Draft EIS should address nocturnal and diurnal impacts to wildlife activities such as foraging, predator avoidance, and nesting that may be affected by new sounds and vibrations introduced to natural habitats.

#1 BIO

Energy Resources

It is our expectation that the HST project will increase annual electricity use and decrease use of diesel fuel and gasoline. Successful implementation of the proposed project depends on the availability of sufficient sources of energy. The Draft EIS should identify the number and capacity of energy facilities that were either operational or under construction as of 2008 and discuss whether the future supply is expected to be adequate to meet growth in demand, given the number of power plants in the pipeline or in planning. The energy analysis should take into consideration the cumulative impact of other planned projects that will also increase demand on the existing energy supply.

#1 energy

Recommendations:

- Identify the number and capacity of energy facilities that were either operational or under construction as of 2008 and discuss whether the future supply is expected to be adequate to meet growth in demand, given the number of power plants in the pipeline or in planning.

- Discuss the cumulative impact of other planned projects that will also increase demand on the existing energy supply. Reasonably foreseeable projects include: (1) the extension of Bay Area Rapid Transit to Warm Springs, San Jose and Santa Clara, (2) the extension of light rail projects in San Jose, and (3) Dumbarton Rail Corridor.

#1 energy

Air Quality

The Draft EIS should provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS), criteria pollutant nonattainment areas, and potential air quality impacts of the project (including cumulative and indirect impacts) for each fully evaluated alternative.

The San Francisco Bay Area is federally designated marginal nonattainment for the 8-hour ozone standard. Because of the area's nonattainment status, it is important to reduce emissions of ozone precursors resulting from the project.

#1 Air Quality

Recommendations:

- Provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS), criteria pollutant nonattainment areas, and potential air quality impacts of the project (including cumulative and indirect impacts) for each alternative.

- Include a thorough analysis of impacts from the construction and operation of the proposed alternatives. Include monitoring data, any anticipated exceedances of NAAQS, and estimates of all criteria pollutant emissions, including the federal 8-hour ozone standard and the $PM_{2.5}$ standard.

- Disclose the available information about the health risks associated with vehicle emissions, sensitive receptors in the vicinity of the project area, and how the proposed project will affect current emission levels.

- Work with the Bay Area Air Quality Management District (BAAQMD), Caltrans, and MTC to ensure that methods to estimate emissions and anticipated emissions values from the proposed project are consistent with Air Quality Management Plan and Regional Transportation Plan (RTP) conformity determinations.

- Use the most current EPA-approved model to estimate emissions, including re-entrained PM-10 emissions and present all methods and assumptions for analyses with pertinent air quality analyses and conclusions.

#1 air quality

- Include an identification of potential hotspot impacts, especially where parking lots, idling locomotives, idling buses, and road modifications are proposed

#1 air quality

General Conformity and Transportation Conformity

The proposed Project may require a general conformity determination by FRA. If required, the Draft EIS should include the general conformity determination with related mitigation commitments. FRA and CHSRA should work with BAAQMD to ensure that anticipated emissions from the proposed project are consistent with the Air Quality Management Plan.

To the extent that the proposed train system will require modification of the existing grade crossings, road network and construction of parking lots and transit facilities, the Draft EIS should identify what elements of this project will require funding or approval by the Federal Highway Administration (FHWA) or Federal Transit Administration (FTA). In addition, the Draft EIS should demonstrate that FHWA or FTA -funded or -approved project elements are included in a conforming transportation plan and a transportation improvement program. FRA and CHSRA should work with BAAQMD and the MTC to ensure that applicable elements of the proposed project are consistent with future revisions of the RTP. The identification of sensitive receptors, and carbon monoxide and particulate matter hotspot analyses should be included in the Draft EIS, especially where parking lots and road modifications are proposed.

Construction Mitigation Measures

The proposed Project will involve construction and staging along a heavily populated corridor. Because of the multiple receptors along the corridor, FRA and CHRSA should identify and commit to specific requirements to reduce emissions.

The Draft EIS should include BAAQMD requirements to reduce emissions. In addition to these measures, EPA recommends the following additional measures to reduce the impacts resulting from future construction associated with this project.

Recommendations:

In light of the serious health impacts associated with $PM_{2.5}$ (fine particulate matter) and diesel exhaust exposure, we recommend that the best available control measures for these pollutants be implemented at all times and recommend that a Construction Emissions Mitigation Plan is incorporated into the Draft EIS. We recommend that all requirements under BAAQMD Guidelines (BAAQMD, 1999), and the following additional measures be incorporated into a Construction Emissions Mitigation Plan, where feasible and appropriate, in order to reduce impacts associated with fugitive dust and emissions of $PM_{2.5}$, diesel exhaust, and mobile source air toxics from construction-related activities:

Fugitive Dust Source Controls:

- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.

- When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

Mobile and Stationary Source Controls:

- Minimize use, trips, and unnecessary idling of heavy equipment.

- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, where applicable, and to perform at verified standards applicable to retrofit technologies. Employ periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications. The California Air Resources Board has a number of mobile source anti-idling requirements which could be employed. See their website at: http://www.arb.ca.gov/msprog/truck-idling/truck-idling.htm

- Prohibit any tampering with engines and require continuing adherence to manufacturer's recommendations.

- If practicable, lease new, clean equipment meeting the most stringent of applicable Federal or State Standards. In general, commit to the best available emissions control technology. Tier 4 engines will be available in the 2009-model year and should be used for project construction equipment to the maximum extent feasible. Lacking availability of non-road construction equipment that meets Tier 4 engine standards, FRA/CHSRA should commit to using the best available emissions control technologies on all equipment.

- Utilize EPA-registered particulate traps and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site.

Administrative controls:

- Specify the means by which impacts to sensitive receptors, such as children, elderly, infirm and others identified in the Draft EIS, will be minimized. For example, locate construction equipment and staging zones away from sensitive receptors and fresh air intakes to buildings and air conditioners.

- Identify where implementation of mitigation measures is rejected based on economic infeasibility. Provide the justification behind not committing to all mitigation measures. Should FRA and CHSRA determine that potential mitigation measures are not economically feasible, the Draft EIS should provide the context behind this decision.

- Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking. (Suitability of control devices is based on: whether there is reduced normal

#1 air quality

availability of the construction equipment due to increased downtime and/or power output, whether there may be significant damage caused to the construction equipment engine, or whether there may be a significant risk to nearby workers or the public.) Meet EPA diesel fuel requirements for off-road and on-highway, and, where appropriate, use alternative fuels such as natural gas and electric.

#1 air quality

Greenhouse Gases

Due to the nature of this Project and the potential greenhouse gases (GHG) benefits that could result, we believe the Project proponents have an opportunity to demonstrate the potential overall GHG benefits of such a project. There are many guidance documents available or expected to be available in the near future.

#1 climate change

EPA is available to coordinate regarding analysis of GHGs. Please refer to our detailed comments on the HST Project Environmental Analyses Methodologies for further recommendations on the analysis of GHG emissions in the project level EISs.

Additionally, EPA recommends the Draft EIS should ultimately identify the cumulative contributions and reductions to GHG emissions that will result from implementation of the Project. We also recommend that the project level EIS discuss the potential impacts of climate change on the Project. Finally, the project level EIS should identify if there are specific mitigation measures needed to 1) protect projects from the effects of climate change, 2) reduce the Project's adverse air quality effects, and/or 3) promote pollution prevention or environmental stewardship. Any design and operation measures that can be identified as reducing GHGs should be identified in the EISs with an estimate of the GHG emissions reductions that would result if measures were ultimately implemented.

Tunneling Methodology and Impacts

#2 tunneling

As applicable, the Draft EIS should identify the amount of material to be removed per mile of tunnel and where material will be disposed or stored. Any impacts associated with the transport and storage of fill should be described and mitigated. Discuss the tunneling methodology to be utilized and the corresponding environmental impacts. Identify specific design measures and options to insure that the full scope of environmental impacts associated with tunneling are considered in project design.

Recommendations:

- Discuss the methodology proposed for any alternative design that involves tunneling, including equipment and planned locations for staging tunnel operations and methods for transportation of tunnel equipment.

- Quantify the environmental impacts associated with the tunneling and required connected actions, for example amount of material removed per mile tunnel, impacts associated with storage of removed material, road access required, impacts associate with the transport of removed material, etc.

- Discuss the potential impacts of tunneling on the existing transportation network.

- Address the potential for tunneling to affect stream flows, riparian habitat, the direction of lateral movement of water through the soil profile, and the recharge of shallow, unconfined aquifers.

#2 Tunnel
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Cumulative Impact Analysis

Cumulative impacts are defined in the Council on Environmental Quality's (CEQ) NEPA regulations as the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR 1508.7). The cumulative impacts analysis should provide the context for understanding the magnitude of the impacts of the alternatives by analyzing the impacts of other past, present, and reasonably foreseeable projects or actions and then considering those cumulative impacts in their entirety. These actions include both transportation and non-transportation activities. Where adverse cumulative impacts are identified, the Draft EIS should disclose the parties that would be responsible for avoiding, minimizing, and mitigating those adverse impacts (CEQ's Forty Most Frequently Asked Questions #19).

#1 Cumulative

Recommendations:

- The cumulative impact analysis should consider transportation and non-transportation projects such as large-scale developments and approved urban planning projects that are reasonably foreseeable and are identified within city and county planning documents.

#1 Cumulative

- The cumulative impact analysis should describe the "identifiable present effects" to various resources attributed to past actions. The purpose of considering past actions is to determine the current health of resources. This information forms the baseline for assessing potential cumulative impacts and can be used to develop cooperative strategies for resources protection (CEQ's Forty Most Frequently Asked Questions #19). Identify the current condition of the resource as a measure of past impacts. For example, the percentage of wetlands lost to date.

- Identify the future condition of the resource based on an analysis of the cumulative impacts of reasonably foreseeable projects or actions added to existing conditions and current trends. Identify the trend in the condition of the resource as a measure of present impacts. For example, the health of the resource is improving, declining, or stasis.

- The cumulative impact analysis should identify potential large, landscape-level statewide and regional impacts, as well as potential large-scale mitigation measures. The analysis should examine landscape-level impacts to the human and natural environment on a statewide and regional scale. The cumulative impact analysis should guide minimization measures and mitigation efforts. Disclose the parties that will be responsible for avoiding, minimizing, and mitigating impacts, as well as a timeline for implementing mitigation measures.

#1 Cumulative

- EPA recommends that FRA and CHSRA use Caltrans recently published cumulative impacts guidance, which is applicable to cumulative impact analyses for non-road projects. This guidance can be found at [http://www.dot.ca.gov/ser/cumulative_guidance/purpose.htm].

#1 cumulative

Growth Inducing Analysis

EPA recommends making both the methodology and the assumptions in the growth inducing analysis as transparent as possible to the public and decision makers.

Recommendations:

- Identify which land use model will be used, discuss its strengths and weaknesses, and describe why it was selected.

- Identify the assumptions used in the model, the strengths and weaknesses of the assumptions, and why those assumptions were selected. For example, describe which method will be used to allocate growth to analysis zones, its strengths and weaknesses, and why that method was selected.

- Ground truth the results of the land use model by enlisting local expertise involved in land use issues, such as local government officials, land use and transportation planners, home loan officers, and real estate representatives. Use their collective knowledge to validate or modify the results of the land use model.

- Use the results of the growth inducing analysis to inform station locations, and parking lot size and locations, as well as mitigation measures to reduce environmental impacts.

- Identify station locations that are currently zoned for high density development and those that are not. Address potential growth-related mitigation efforts, including incentives for transit-oriented development, measures to increase the capacity of city/county planning efforts, and mechanisms to encourage transit oriented development.

- Use FHWA and Caltrans recently published growth-related impacts guidance, which is applicable to growth-related impact analyses for non-road projects outside of California. This guidance can be found at [http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/gri_guidance.htm].

#1 pop + Housing

Environmental Justice

Executive Order 12898 addresses Environmental Justice in minority and low income populations, and the Council on Environmental Quality has developed guidance concerning how to address Environmental Justice in the environmental review process (http://ceq.eh.doe.gov/nepa/regs/ej/justice.pdf).

#1 env Justice

Recommendations:

- Identify how the proposed alternatives may affect the mobility of low-income or minority populations in the surrounding area.

- Provide specific, appropriate mitigation measures for any anticipated adverse impacts to community members.

- Include opportunities for incorporating public input to promote context sensitive design, especially in Environmental Justice communities.

#1 env Justice

Water Resources

The Clean Water Act Section 404(b)(1) Guidelines (Guidelines) at 40 CFR Part 230.10(a) state that ". . .no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." While EPA has concurred that the HST alternative alignments identified in the Final Bay Area to Central Valley Programmatic EIS are "most likely to contain" the least environmentally damaging practicable alternative (LEDPA), FRA and CHSRA will have to demonstrate in the Draft EIS for this Project that potential impacts to waters of the United States have been avoided and minimized to the maximum extent practicable prior to obtaining a CWA Section 404 permit (40 CFR 230.10(a) and 230.10(d)).

#1 Hydro utilities

Recommendations:

- In the Draft EIS for the San Francisco to San Jose HST Project, follow through with commitments made in the statewide Tier 1 Final Programmatic EIS (Final PEIS), specifically "Avoidance and minimization measures would be incorporated into the development, design, and implementation phases at project-level environmental analysis. In addition, close coordination will occur with the regulatory agencies to develop specific design and construction standards for stream crossings, infrastructure setbacks, monitoring during construction, and other best management practices" (Final PEIS, Page 3.17-25).

- Ensure the mitigation measures as listed in the table starting on page 3.17-28 of the Final PEIS are incorporated in the Draft EIS (see enclosure).

- Demonstrate that all potential impacts to waters of the United States have been avoided and minimized. If these resources cannot be avoided, the Draft EIS analyses should clearly demonstrate how cost, logistical, or technological constraints preclude avoidance and minimization of impacts.

- Identify design measures and modifications to avoid and minimize impacts to water resources. Quantify the benefits achieved for each alternative studied, for example, number of stream crossings avoided, acres of waters of the United States avoided, etc.

- Identify all protected resources with special designations and all special aquatic sites and waters within state, local, and federal protected lands. Additional steps should be taken to avoid and minimize impacts to these areas.

#1 Hydro Utilities

Biological Resources

EPA is supportive of FRA and CHSRA previous commitments in the statewide Tier 1 Final PEIS that "project-level studies will identify areas where it is important to maintain connectivity and will ensure that sufficient mitigation is included to maintain movement corridors," and "wildlife underpasses or overpasses will be added to the (HST) at-grade alignments, where appropriate, to reduce the overall effects on wildlife corridors and movements" (Final PEIS Appendix 2, Chapter 9, Standard Response 3.15.9). EPA provides the following recommendations to be implemented by FRA and CHSRA for the Draft EIS. Much of the information identified below is now available for FRA and CHSRA to use in landscape-level analyses, and up-front data compilation and coordination with species experts prior to initiation of project-level planning will contribute to a better understanding of the measures needed to reduce impacts to biological resources.

#1 BIO

Recommendations:

- Incorporate information developed for the California Missing Linkages Report and identify how alternatives have been designed to allow for continued wildlife movement: http://scwildlands.org/missinglinks/reports/download_missinglinkages.htm

- Use data developed for the statewide California Wildlife Action Plan (CWAP) to inform the siting of alternatives and mitigation ideas. Identify in the Draft EIS the specific design changes proposed to avoid resources. The CWAP addresses 800 at-risk species and provides range maps. The range maps for these species are available from the California Department of Fish and Game. http://www.dfg.ca.gov/habitats/WDP/

- In addition to locating the available data indicating where species ranges may be bisected by the HST system, EPA recommends that FRA and CHSRA facilitate a meeting of scientists and local experts to explore the specific locations and design features for wildlife crossings that are needed.

- Identify the connections that would likely remain after construction of the HST system and highlight these areas as "connectivity zones" for protection and preservation. In the Draft EIS, identify specific commitments for preservation of these corridors through mitigation measures and cooperative agreements.

- Disclose how fencing the train route will affect wildlife movement and discuss how fencing for safety purposes will be integrated with proposed wildlife passages, such as culverts, bridges, viaducts, underpasses, and overpasses.

Invasive Species

The proposed Project may include impacts to vegetation within the existing right-of-way and mitigation is proposed as a result of ground disturbance and tree removal. Executive Order 13112 on Invasive Species calls for the restoration of native plant and tree species.

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Recommendation:

- To the extent that this project will entail new landscaping and tree replacement, the mitigation measures should describe how the project will meet the requirements of Executive Order 13112 by using native species. Replacement of trees and revegetation should be coordinated with appropriate city and county urban foresters and native species should be utilized where feasible.

We look forward to maintaining our working relationship with FRA and CHSRA as we continue to coordinate on a proposed HST system for California. If you have any questions, please feel free to contact Connell Dunning, Transportation Team Leader, at 415-947-4161, or Tom Plenys, the lead reviewer for this project. Tom can be reached at 415-972-3238 or plenys.thomas@epa.gov.

Sincerely,

Tom Plenys
Environmental Review Office

Enclosure: Mitigation Strategies, Bay Area to Central Valley HST Final Program EIR/EIS

CC: Dan Leavitt, California High Speed Rail Authority
Mehdi Morshed, California High Speed Rail Authority
Jane Hicks, Army Corps of Engineers
Robert Smith, Army Corps of Engineers
Mark Littlefield, U.S. Fish and Wildlife Service
Susan K. Moore, U.S. Fish and Wildlife Service
Ray Sukys, Federal Transit Administration
Gary Sweeten, Federal Highway Administration
Marie Pang, Peninsula Corridor Joint Powers Board
Lindy Lowe, San Francisco Bay Conservation and Development Commission
Scott Wilson, California Department of Fish and Game
James B. Richards, Caltrans

Resource Area	Impact Area	Mitigation Measure
Traffic and circulation	Traffic and circulation	Require that HST system stations serve as multi-modal transportation hubs providing easy connection to local/regional bus, rail, and transit services, as well as providing bicycle and pedestrian access.
		Require the HST system to be grade-separated from all roadways to allow vehicular traffic to flow without impediment from the HST system.
		Work with local and regional agencies to develop and implement transit-oriented development strategies, as described in Chapter 6, around HST stations.
		Work with local and regional agencies to identify, plan, coordinate, and implement traffic flow improvements around HST station locations during project-level planning. Such improvements may include: a. a construction phasing and traffic management plan for construction periods; b. improving capacity of local streets with upgrades in geometrics such as providing standards roadway lane widths, traffic controls, bicycle lanes, shoulders, and sidewalks; c. modifications at intersections, such as signalization and/or capacity improvements (widening for additional left-turn and/or through lanes), and turn prohibitions; d. signal coordination and optimization (including retiming and rephasing); e. designation of one-way street patterns near some station locations; f. truck route designations; and g. coordination with Caltrans regarding nearby highway facilities.
		Work with public transportation providers to coordinate services and to increase service and/or add routes, as necessary, to serve the HST station areas.
		Avoid parking impacts by developing and coordinating implementation at the project-level of parking improvement strategies consistent with local policies, including shared parking, offsite parking with shuttles, parking and curbside use restrictions, parking permit plans for neighborhoods near HST stations, and other parking management strategies.
Air quality	Localized air quality impacts due to congestion/traffic near HST stations	Assure that HST stations are multi-modal hubs and include appropriate parking.
		Coordinate with local and regional public transportation providers to increase opportunities for connection between the HST system and other public transportation services.
		Work with local and regional agencies to implement local street and roadway improvements, including various traffic flow improvements and congestion management techniques, and parking management strategies to reduce localized pollution from traffic related to the HST system.
	Short-term air quality impacts due to construction	Water all active construction areas at least twice daily.
		Require that all trucks hauling soil, sand, and other loose materials be covered or maintain at least 2 feet of freeboard.
		Pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at active construction sites.
		Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at active construction sites.
		Sweep nearby streets daily (with water sweepers) if visible soil materials from HST system construction are carried onto adjacent public streets.
		Hydroseed or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
		Enclose, cover, water twice daily, or apply nontoxic soil binders to exposed stockpiles of dirt, sand, etc.
		Limit traffic speeds on unpaved roads to 15 mph.

Resource Area	Impact Area	Mitigation Measure
		Install sand bags or other erosion control measures to prevent silt runoff to public roads.
		Replant vegetation in disturbed areas as quickly as possible.
		Use alternative fuels for construction equipment when feasible.
		Minimize equipment idling time.
		Maintain properly tuned equipment.
Noise	Increased noise from train operations and construction	Grade separations to eliminate grade crossing related noise.
		Noise barriers, such as sound walls, where there are severe noise impacts.
		Require noise reduction in HST equipment design and track structures design.
		Use of enclosures or walls to surround noisy equipment, and installation of mufflers on engines; substituting quieter equipment or construction methods, minimizing time of operation, and locating equipment farther from sensitive receptors.
		Where not already included, consider placing alignment sections in tunnel or trenches or behind berms where possible and where other measures are not available to reduce significant noise impacts.
		Suspend construction between 7:00 pm and 7:00 am and/or on weekends or holidays in residential areas where there are severe noise impacts.
		In managing construction noise, take into account local sound control and noise level rules, regulations, and ordinances.
		Ensure that each internal combustion engine is equipped with a muffler of a type recommended by the manufacturer.
		Specify the use of the quietest available construction equipment where appropriate and feasible.
		Turn off construction equipment during prolonged periods of nonuse.
		Require contractors to maintain all equipment and to train their equipment operators.
		Locate noisy stationary equipment away from noise sensitive receptors.
	Exposure to ground-borne vibration	Specify the use of train and track technologies that minimize ground vibration such as state of the art suspensions, resilient track pads, tie pads, ballast mats, or floating slabs.
		Phase construction activity, use low impact construction techniques, and avoid use of vibrating construction equipment where possible to avoid vibration construction impacts.
Energy	Increased energy use and electricity demand with the HST system	HST stations will be multi-modal hubs providing linkage for various transportation modes, which will contribute to increased efficiency of energy use for intercity trips and by commuters, and the stations will be required to be constructed to meet Title 24 California Code of Regulations energy efficiency standards.
		Design practices will require that the electrically powered HST technology be energy efficient, include regenerative braking to reduce energy consumption, and minimize grade changes in steep terrain to reduce energy consumption.
		Design practices will require that localized impacts be avoided through planning and design of the power distribution system for the HST system.
		Locate HST maintenance and storage facilities within proximity to major stations/termini.
	Energy use during construction of the HST system	Develop and implement a construction energy conservation plan.
		Use energy efficient construction equipment and vehicles.
		Locate construction material production facilities on site or in proximity to project construction sites.

Resource Area	Impact Area	Mitigation Measure
		Develop and implement a program encouraging construction workers to carpool or use public transportation for travel to and from construction sites.
Electromagnetic fields and electromagnetic interference	Exposure of electromagnetic fields to HST system workers, passengers, and nearby residents, schools and other facilities	Use standard design practices for overhead catenary power supply systems and vehicles, including appropriate materials, location and spacing of facilities, and power supply systems to minimize exposure to receptors over distance, and shielding with vegetation and other screening materials.
		Design overhead catenary system, substations, and transmission lines to reduce the electromagnetic fields to a practical minimum.
	Electromagnetic interference with electronic and electrical devices	Design the overhead catenary system, substations, and transmission lines to reduce the electromagnetic fields to a practical minimum.
		Design the project component to minimize arcing and radiation of radiofrequency energy.
		Choose devices generating radio frequency with a high degree of electromagnetic compatibility.
		Where appropriate, add electronic filters to attenuate radio frequency interference.
		Relocate receiving antennas and use antenna models with greater directional gain where appropriate, particularly for sensitive receptors near the HST system.
		Comply with the FCC regulations for intentional radiators, such as the proposed HST wireless systems.
		Establish safety criteria and procedures and personnel practices to avoid exposing employees with implantable medical devices to EMF levels that may cause interference with such implanted biomedical devices.
Land use	Incompatibility with land uses and disruption to communities	Continue to apply design practices to minimize property needed for the HST system and to stay within or adjacent to existing transportation corridors to the extent feasible.
		Work with local governments to consider local plans and local access needs, and to apply design practices to limit disruption to communities.
		Work with local governments to establish requirements for station area plans and opportunities for transit-oriented development.
		Work with local governments to enhance multi-modal connections for HST stations.
		Coordinate with cities and counties to ensure that HST facilities will be consistent with land use planning processes and zoning ordinances.
		Provide opportunities for community involvement early in project-level studies.
		Hold design workshops in affected neighborhoods to develop understanding of vehicle, bicycle, and pedestrian linkages in order to preserve those linkages through use of grade-separated crossings and other measures.
		Ensure that connectivity is maintained across the rail corridor (pedestrian/bicycle and vehicular crossings) where necessary to maintain neighborhood integrity.
		Develop facility, landscape, and public art design standards for HST corridors that reflect the character of adjacent affected neighborhoods.
		Maintain high level of visual quality of HST facilities in neighborhood areas by implementing such measures as visual buffers, trees and other landscaping, architectural design, and public artwork.
	Impacts to neighborhoods during construction	Develop a traffic management plan to reduce barrier effects during construction.
		To the extent feasible, maintain connectivity during construction.
Agricultural	Conversion of	Avoid farmland whenever feasible during the conceptual design stage of the project.

Resource Area	Impact Area	Mitigation Measure
lands	prime, statewide important, and unique farmlands, and farmlands of local importance, to project uses	Reduce the potential for impacts by sharing existing rail rights-of-way where feasible or by aligning HST features immediately adjacent to existing rail rights-of-way.
		Reduce the potential for impacts by reducing the HST right-of-way width to 50 feet in constrained areas.
		Increase protection of existing important farmlands by securing easements or participating in mitigation banks.
		Coordinate with and support the California Farmland Conservancy Program to secure conservation easements on farmland in geographic areas where the HST project creates impacts.
		Coordinate with private agricultural land trusts, local programs, mitigation banks, and Resource Conservation Districts to identify additional measures to limit important farmland conversion or provide further protection to existing important farmland.
	Severance of prime, statewide important, and unique farmlands, and farmlands of local importance, to project uses	Avoid farmland whenever feasible during the conceptual design stage of the project.
		Minimize severance of agricultural land by constructing underpasses and overpasses at reasonable intervals to provide property access.
		Work with landowners during final design of the system to enable adequate property access.
		Provide appropriate severance payments to landowners.
Aesthetics and visual resources		At the project-level, design proposed facilities that are attractive in their own right and that will integrate well into landscape contexts, so as to reduce potential view blockage, contrast with existing landscape settings, light and shadow effects, and other potential visual impacts.
		Design bridges and elevated guideways with graceful lines and minimal apparent bulk and shading effects.
		Design elevated guideways, stations, and parking structures with sensitivity to the context, using exterior materials, colors, textures, and design details that are compatible with patterns in the surrounding natural and built environment, and that minimize the contrast of the structures with their surroundings.
		Use neutral colors and dulled finishes that minimize reflectivity for catenary support structures, and design them to fit the context of the specific locale.
		Use aesthetically appropriate fencing along rights-of-way, including decorative fencing, where appropriate, and use dark and non-reflective colors for fencing to reduce visual contrast.
		Where at-grade or depressed route segments pass through or along the edge of residential areas or heavily traveled roadways, install landscape treatments along the edge of the right-of-way to provide partial screening and to visually integrate the right-of-way into the residential context.
		Use the minimum amount of night lighting consistent with that necessary for operations and safety.
		Use shielded and hooded outdoor lighting directed to the area where the lighting is required, and use sensors and timers for lights not required to be on all the time.
		Design stations to minimize potential shadow impacts on adjacent pedestrian areas, parks, and residential areas, and site all structures in a way that minimizes shadow effects on sensitive portions of the surrounding area.
		Seed and plant areas outside the operating rail trackbed that are disturbed by cut, fill, or grading to blend with surrounding vegetated areas, where the land will support plants. Use native vegetation in appropriate locations and densities.

Resource Area	Impact Area	Mitigation Measure
		Use strategic plantings of fast-growing trees to provide partial or full screening of elevated guideways where they are close to residential areas, parks, and public open spaces.
		Where elevated guideways are located down the median strips or along the edge of freeways or major roadways, use appropriate landscaping of the area under the guideway to provide a high level of visual interest. Landscaping in these areas should use attractive shrubs and groundcovers and should emphasize the use of low-growing species to minimize any additional shadow effects or blockage of views.
		Plan hours of construction operations and locate staging sites to minimize impacts to adjacent residents and businesses.
Public utilities		Make adjustments to the HST alignments and vertical profiles to avoid crossing or using major utility right-of-way or fixed facilities during engineering design.
		If avoidance is not feasible, in consultation and coordination with the utility owner, relocate or protect in-place transmission lines, substations, and any other affected facilities.
		For acquisition projects which result in utility relocation, follow the uniformity and equitable treatment policies, and comply with the requirements, of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 for all property necessary for the proposed HST system.
Hazardous materials and wastes		Investigate soils and groundwater for contamination and prepare environmental site assessments when necessary.
		Design realignment of the HST corridors to avoid identified sites.
		Relocate HST associated facilities such as stations to avoid identified sites.
		Remediate identified hazardous materials and hazardous waste contamination.
		Prior to demolition of buildings for project construction, survey for lead-based paint and asbestos-containing materials.
		Follow BMPs for testing, treating, and disposing of water, and acquire necessary permits from the regional water quality control board, if ground dewatering is required.
		When indicated by project-level environmental site assessments, perform Phase II environmental site assessments in conformance with the ASTM Standards related to the Phase II Environmental Site Assessment Process to identify specific mitigation measures.
		Prepare a Site Management Program/Contingency Plan prior to construction to address known and potential hazardous material issues, including: a. measures to address management of contaminated soil and groundwater; b. a site-specific Health and Safety Plan (HASP), including measures to protect construction workers and general public; and c. procedures to protect workers and the general public in the event that unknown contamination or buried hazards are encountered.
		As part of the second-tier environmental review, consider impacts to the environment on sites identified on the Cortese list (Government Code Section 65962.4) at that time.
Cultural and paleon-tological resources	Impacts to archaeological resources and traditional cultural properties	Avoid the impact, or when avoidance cannot be accommodated, minimize the scale of the impact.
		Incorporate the site into parks or open space.
		Provide data recovery for archaeological resources, which may include excavation of an adequate sample of the site contents so that research questions applicable to the site can be addressed.

Resource Area	Impact Area	Mitigation Measure
		Develop procedures for fieldwork, identification, evaluation, and determination of potential effects to archaeological resources in consultation with SHPO and Native American tribes. Procedures may include onsite monitoring when sites are known or suspected of containing Native American human remains and be reflected in Memoranda of Agreement with appropriate bodies.
		Coordinate and consult with tribal representatives.
	Impacts to historic properties/ resources	Avoid the impact through project design. Prepare and utilize a treatment plan for protection of historic properties/resources that will describe methods to preserve, stabilize, shore/underpin, and monitor buildings, structures, and objects.
		Avoid high vibration construction techniques in sensitive areas.
		Record and document cultural resources that would be adversely affected by the project to the standards of the Historic American Building Survey or Historic American Engineering Record.
		Develop design guidelines to ensure sympathetic, compatible, and appropriate designs for new construction.
		Consult with architectural historians or historical architects to advise on appropriate architectural treatment of the structural design of proposed new structures. Prepare interpretive and/or educational materials and programs regarding the affected historic properties/resources. Materials may include: a popular report, documentary videos, booklets, and interpretive signage.
		Make interpretive information available to state and local agencies, such as salvage items, historic drawings, interpretive drawings, current and historic photographs, models, and oral histories. Also assist with archiving and digitizing the documentation of the cultural resources affected and disseminating material to the appropriate repositories.
		Relocate and rehabilitate historic properties/resources that would otherwise be demolished because of the project.
		Monitor project construction to ensure it conforms to design guidelines and any other treatment procedures agreed to by the parties consulting pursuant to Section 106 of the National Historic Preservation Act. Repair inadvertent damage to historic properties/resources in accordance with the Secretary of the Interior's Standards for Treatment of Historic Properties.
		Salvage selected decorative or architectural elements of the adversely affected historic properties/resources, and retain and incorporate salvaged items into new construction where possible. If reuse is not possible, make salvaged items available for use in interpretive displays near the affected resources or in an appropriate museum.
		Implement an agreement with appropriate bodies specifying procedures for addressing historic resources which may be affected by the HST system.
	Impacts to paleontological resources	Educate workers.
		Recover fossils identified during the field reconnaissance.
		Monitor construction.
		Develop protocols for handling fossils discovered during construction, such as temporary diversion of construction equipment so that the fossils could be recovered, identified, and prepared for dating, interpreting, and preserving at an established, permanent, accredited research facility.
Geology and soils	Seismic hazards	Design structures to withstand anticipated ground motion, using design options such as redundancy and ductility.
		Prevent liquefaction and resulting structural damage and traffic hazards using: 1. ground modification techniques such as soil densification; and 2. structural design, such as deep foundations.

Resource Area	Impact Area	Mitigation Measure
		Utilize motion sensing instruments to provide ground motion data and a control system to temporarily shut down HST operations during or after an earthquake to reduce risks.
		Design and engineer all structures for earthquake activity using Caltrans Seismic Design Criteria.
		Design and install foundations resistant to soil liquefaction and settlement.
		Identify potential serpentinite bedrock disturbance areas and implement a safety plan.
		Apply Section 19 requirements from the most current Caltrans Standard Specifications to ensure geotechnically stable slopes are planned and created.
		Install passive or active gas venting systems and gas collection systems in areas where subsurface gases are identified.
		Remove corrosive soil and use corrosion protected materials in infrastructure.
		Address erosive soils through soil removal and replacement, geosynthetics, vegetation, and/or riprap, where warranted.
		Remove or moisture condition shrink/swell soils.
		Utilize stone columns, grouting, and deep dynamic compaction in areas of potential liquefaction.
		Utilize buttress berms, flattened slopes, drains, and/or tie-backs in areas of slope instability.
		Avoid settlement through preloading, use of stone columns, deep dynamic compaction, grouting, and/or special foundation designs.
	Surface rupture hazards	Install early warning systems triggered by strong ground motion associated with ground rupture, such as linear monitoring systems (i.e., time domain reflectometers) along major highways and rail lines within the zone of potential rupture to provide early warnings and allow for temporary control of rail and automobile traffic to avoid and reduce risks.
		Continue to modify alignments to avoid crossing known or mapped active faults within tunnels.
		Avoid active faults to the extent possible. Where avoidance is not possible, cross active faults at grade and perpendicular to the fault line.
	Slope instability	Install temporary and permanent slope reinforcement and protection, based on geotechnical investigations, and review of proposed earthwork and foundation excavation plans.
		Conduct geotechnical inspections during construction to verify that no new unanticipated conditions are encountered.
		Incorporate slope monitoring in final design.
	Difficulty in excavation	Identify areas of potentially difficult excavation to ensure safe practices.
		Focus future geotechnical engineering and geologic investigations in areas of potentially difficult excavation.
		Monitor conditions during and after construction.
		Employ tunnel excavation and lining techniques to ensure safety.
	Hazards related to oil and gas fields	Follow federal and state Occupational Safety and Health Administration regulatory requirements for excavations.
		Consult with other agencies such as the Department of Conservation's Division of Oil and Gas, or the Department of Toxic Substances Control regarding known areas of concern.
		Use safe and explosion-proof equipment during construction.

Resource Area	Impact Area	Mitigation Measure
		Test for gases regularly.
		Install monitoring systems and alarms in underground construction areas and facilities where subsurface gases are present.
		Install gas barrier systems.
Hydrology and water resources	Impacts on floodplains	Avoid or minimize construction of facilities within floodplains where feasible.
		Minimize the footprint of facilities within the floodplain through design changes or the use of aerial structures and tunnels.
		Restore the floodplain to its prior operation in instances where the floodplain is affected by construction.
	Impacts on surface waters	Use construction methods and facility designs to minimize the potential encroachments onto surface water resources.
		Minimize sediment transport caused by construction by following BMPs as part of NPDES and SWPPP requirements that will be included in construction permits. BMPs may include measures such as: a. providing permeable surfaces where feasible; b. retaining and treating stormwater on site using catch basins and filtering wet basins; c. minimizing the contact of construction materials, equipment, and maintenance supplies with stormwater; d. reducing erosion through soil stabilization, watering for dust control, installing perimeter silt fences, placing rice straw bales, and installing sediment basins; e. maintaining water quality by using infiltration systems, detention systems, retention systems, constructed wetland systems, filtration systems, biofiltration/bioretention systems, grass buffer strips, ponding areas, organic mulch layers, planting soil beds, sand beds, and vegetated systems such as swales and grass filter strips that are designed to convey and treat either fallow flow (swales) or sheetflow (filter strips) runoff.
		Use methods such as habitat restoration, reconstruction of habitat on site, and habitat replacement off site to minimize surface water quality impacts.
		Comply with mitigation measures included in permits issued under Sections 404 and 401 of the federal Clean Water Act.
		Comply with requirements in the SWPPP to reduce pollutants in storm water discharges and the potential for erosion and sedimentation.
		Comply with requirements of Section 10 of the federal Rivers and Harbors Act for work required around a water body designated as navigable and applicable permit requirements.
		Comply with the requirements of a state Streambed Alteration Agreement for work along the banks of various surface water bodies.
		Implement a spill prevention and emergency response plan to handle potential fuel or other spills.
		Where feasible, avoid significant development of facilities in areas that may have substantial erosion risk, including areas with erosive soils or steep slopes.
	Impacts on groundwater	Minimize development of facilities in areas that may have substantial groundwater discharge or affect recharge.
		Apply for, obtain, and comply with conditions of applicable waste discharge requirements as part of project-level review.
		Develop facility designs that are elevated, or at a minimum are permeable, and will not affect recharge potential where construction is required in areas of potentially substantial groundwater discharge or recharge.

Resource Area	Impact Area	Mitigation Measure
		Apply for and obtain a SWPPP for grading, with BMPs that will control release of contaminants near areas of surface water or groundwater recharge. BMPs may include constraining fueling and other sensitive activities to alternative locations, providing drip plans under some equipment, and providing daily checks of vehicle condition.
		Use and retain native materials with high infiltration potential at the ground surface in areas that are critical to infiltration for groundwater recharge.
Biological resources and wetlands	Impacts to sensitive vegetation communities (as defined at the project level)	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Use large diameter tunnels as part of the design to limit surface access needs in tunnels for ventilation or evacuation, as a method to avoid or limit impacts to vegetation and habitat above tunnels.
		Use in-line construction (i.e., use new rail infrastructure as it is built) to transport equipment to/from the construction site and to transport excavated material away from the construction to appropriate re-use or disposal sites to minimize impacts from construction access roads on vegetation/habitat.
		Accomplish necessary geologic exploration in sensitive areas by using helicopters to transport drilling equipment and for site restoration to minimize surface disruption.
		Use and reuse excavated materials within the confines of the project.
		Participate in or contribute to existing or proposed conservation banks or natural management areas, including possible acquisition, preservation, or restoration of habitats.
		Revegetate/restore impacted areas, with a preference for onsite mitigation over offsite, and with a preference for offsite mitigation within the same watershed or in close proximity to the impact where feasible.
		Comply with the Biological Resources Management Plan(s) developed or identified during project-level studies, as reviewed by the USFWS, CDFG, and USACE.
		Conduct preconstruction focused biological surveys.
		Conduct biological construction monitoring.
		Undertake plant relocation, seed collection, plant propagation, and outplanting at suitable mitigation sites.
		Prevent the spread of weeds during construction and operation by identifying areas with existing weed problems and measures to control traffic moving out of those areas such as cleaning construction vehicles or limiting the movement of fill.
	Impacts to wildlife movement corridors	Construct wildlife underpasses, bridges, and/or large culverts to facilitate known wildlife movement corridors.
		Ensure that wildlife crossings are of a design, shape, and size to be sufficiently attractive to encourage wildlife use.
		Provide appropriate vegetation to wildlife overcrossings and undercrossings to afford cover and other species requirements.
		Establish functional corridors to provide connectivity to protected land zoned for uses that provide wildlife permeability.

Resource Area	Impact Area	Mitigation Measure
		Design protective measures for wildlife movement corridors using the following process in consultation with resource agencies: a. identify the habitat areas the corridor is designed to connect; b. select several species of interest from the species present in the area; c. evaluate the relevant needs of each selected species; d. for each potential corridor, evaluate how the area will accommodate movement by each species of interest; e. draw the corridors on a map; and f. design a monitoring program.
		Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Use aerial structures or tunnels to allow for unhindered crossing by wildlife.
	Impacts to nonwetland jurisdictional waters	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Return degraded habitat to pre-existing conditions.
		Create new habitat by converting nonwetland habitats into wetland or other aquatic habitat.
		Enhance existing habitats by increasing one or more functions through activities such as plantings or nonnative vegetation eradication.
		Provide for passive revegetation by allowing a disturbed area to revegetate naturally.
		Purchase credits in an existing wetlands or aquatic habitat mitigation bank.
		Provide in-lieu fee payments to an agency or other entity who will provide aquatic habitat conservation or restoration.
		Prefer onsite mitigation over offsite mitigation, and for offsite mitigation, prefer that it be located within the same watershed or as close in proximity to the area of impact as possible.
	Impacts to wetlands	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Return degraded habitat to pre-existing conditions.
		Create new habitat by converting nonwetland habitats into wetland or other aquatic habitat.
		Enhance existing habitats by increasing one or more functions through activities such as plantings or nonnative vegetation eradication.
		Provide for passive revegetation by allowing a disturbed area to revegetate naturally.
		Purchase credits in an existing wetlands or aquatic habitat mitigation bank.
		Provide in-lieu fee payments to an agency or other entity who will provide aquatic habitat conservation or restoration.
		Develop and implement measures to address the "no net loss" policy for wetlands.
		Prefer onsite mitigation over offsite mitigation, and for offsite mitigation, prefer that it be located within the same watershed or as close in proximity to the area of impact as possible.
	Impacts to marine and anadromous fishery resources	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Comply with the terms of a Streambed Alteration Agreement for work along banks of surface water bodies.
		Implement a spill prevention and emergency response plan to handle potential fuel or other spills.
		Incorporate biofiltration swales to intercept runoff.

Resource Area	Impact Area	Mitigation Measure
		Where feasible, avoid significant development of facilities in areas that may have substantial erosion risk, including areas with erosive soils and steep slopes.
	Impacts to special status species	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Relocate sensitive species.
		Conduct preconstruction focused surveys.
		Conduct biological construction monitoring.
		Restore suitable breeding and foraging habitat.
		Purchase credits from an existing mitigation bank.
		Participate in an existing Habitat Conservation Plan.
		Phase construction around the breeding season.
Public parks and recreation resources	Impacts to parks and recreational resources	Continue to apply design practices to avoid impacts to park resources, and when avoidance cannot be accommodated, minimize the scale of the impact.
		Apply measures at the project level to reduce and minimize indirect/proximity impacts as appropriate for the particular sites affected, while avoiding other adverse impacts (e.g., visual), such as noise barriers, visual buffers, and landscaping.
		Apply measures to modify access to/egress from the recreational resource to reduce impacts to these resources.
		Design and construct cuts, fill, and aerial structures to avoid and minimize visual impacts to units of the state park system.
		Incorporate wildlife under- or overcrossings at appropriate intervals as necessary.
		Where public parklands acquired with public funds will be acquired for nonpark use as part of the HST system, commit as required by law to providing funds for the acquisition of substantially equivalent substitute parkland or to acquiring/providing substitute parkland of comparable characteristics for construction impacts.
		Restore affected parklands to natural state and replace or restore affected park facilities.
		If park facilities must be relocated, provide planning studies as well as appropriate design and replacement with minimal impact on park use.
		Use local native plants for revegetation.
		Develop and implement construction practices, including scheduling, to limit impacts to wildlife, wildlife corridors, and visitor use areas within public parks.
		For temporary unavoidable loss of park and recreation facility uses, consider providing compensation.
Cumulative	Impacts on traffic and circulation and travel conditions	The following program-level mitigation strategies can be developed, in consultation with state, federal, regional, and local governments and affected transit agencies, to improve the flow of intercity travel on the primary routes and access to the proposed stations or airports and would reduce this impact: 1. Regional strategies will include coordination with Regional Transportation planning and Intelligent Transportation System Strategies. 2. Local improvements could employ TSM/Signal Optimization; local spot widening of curves; and major intersection improvements.
		The following program-level mitigation strategies can be developed, in consultation with state, federal, regional, and local governments and affected transit agencies, to improve the flow of intercity travel on the primary routes and access to the proposed stations or airports and would reduce this impact: 1. Regional strategies would include coordination with Regional Transportation planning and Intelligent Transportation System Strategies. 2. Local improvements could employ TSM/Signal Optimization; local spot widening of curves; and major intersection improvements.

Resource Area	Impact Area	Mitigation Measure
	Impacts on air quality	The project-level mitigation strategies to address localized impacts can include the following and would reduce this impact: 1. Increase emission controls from power plants supplying power for the HST alignment. 2. Design the system to utilize energy efficient, state-of-the-art equipment. 3. Promote increased use of public transit, alternative fueled vehicles, and parking for carpools, bicycles, and other alternative transportation methods. 4. Alleviate traffic congestion around passenger station areas. 5. Minimize construction air emissions.
	Impacts on noise and vibration	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices emphasizing the use of tunnels or trenches. 2. Use of electric powered trains, higher quality track interface, and smaller, lighter, and more aerodynamic trainsets. 3. Full grade separations from all roadways.
		The project-level mitigation strategies include the following and would reduce this impact: 1. Treatments for insulation of buildings affected by noise and vibration. 2. Sound barrier walls within the right-of-way. 3. Track treatments to minimize train vibrations. 4. Construction mitigation.
	Impacts on land use and planning, communities and neighborhoods, property, and environmental justice	The program-level mitigation strategies for HST alignment contributions to the land use impacts include the following and would reduce this impact: 1. Design practices to maximize use of existing rights-of-way and incorporating strategies for stations to incorporate transit-oriented design. 2. Coordination with cities and counties in each region to ensure that project facilities will be consistent with land use planning processes and zoning ordinances.
	Impacts on agricultural lands	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices to avoid agricultural land conversion through maximizing use of existing rights-of-way to minimize encroachment on additional agricultural lands. 2. Utilizing aerial structure or tunnel alignments to allow for vehicular and pedestrian traffic access across the alignment. 3. Reducing the new right-of-way to 50 feet in constrained areas.
		The project-level mitigation strategies include the following and would reduce this impact: 1. Securing easements. 2. Participating in mitigation banks. 3. Increasing permanent protection of farmlands at the local planning level. 4. Coordinating with various local, regional, and state agencies support farmland conservation programs.
	Impacts on aesthetics and visual resources	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices that will incorporate local agency and community input during subsequent project-level environmental review in order to develop context sensitive aesthetic designs and treatments for infrastructure.

Resource Area	Impact Area	Mitigation Measure
		The project-level mitigation strategies include the following and would reduce this impact: 1. Design of facilities that integrate into landscape contexts, which will reduce potential view blockage, contrast with existing landscape settings, and light and shadow effects.
	Impacts on public utilities	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices that will avoid potential conflicts, at the project-level analysis, to the extent feasible and practical. These practices include design methods to avoid crossing or using utility rights-of-way by modifying both the horizontal and vertical profiles of proposed transportation improvements. Emphasis will be placed on detailed alignment design to avoid potential contribution to cumulative impacts from linear facilities on land use opportunities and to minimize conflicts with existing major fixed public utilities and supporting infrastructure facilities.
		The project-level mitigation strategies include the following and would reduce this impact: 1. Coordination with utility representatives during construction in the vicinity of critical infrastructure will occur.
	Impacts on cultural and paleontological resources	The program-level mitigation strategies include the following and would reduce this impact: 1. Continued consultation with SHPO will occur to define and describe general procedures to be applied in the future for fieldwork, method of analysis, and the development of specific mitigation measures to address effects and impacts to cultural resources, resulting in a programmatic agreement between the Authority, FRA, and SHPO. 2. Consultation with Native American tribes will occur.
		The project-level mitigation strategies include the following and would reduce this impact: 1. Avoidance measures through identification of sensitive resources within the project-level analysis, project design refinement, and careful selection of alignments. 2. Subsequent project-level field studies to verify the location of cultural resources will offer opportunities to avoid or minimize direct impacts on resources, based on the type of project, type of property, and impacts to the resource.
	Impacts on geology and soils	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices will be used while preparing extensive alignment studies to ensure that potential effects related to major geologic hazards such as major fault crossings, oil fields, and landslide areas will be avoided. 2. Mitigation for potential impacts will be developed on a site-specific basis, based on detailed geotechnical studies to address ground shaking, fault crossings, slope stability/landslides, areas of difficult excavation, hazards related to oil and gas fields, and mineral resources.
	Impacts on hydrology and water resources	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices to maximize use of existing rights-of-way to minimize potential impacts on water resources.

Resource Area	Impact Area	Mitigation Measure
		The project-level mitigation strategies include the following and would reduce this impact: 1. Avoidance and minimization measures will be incorporated into the development, design, and implementation phases. 2. Close coordination will occur with the regulatory agencies to develop specific design and construction standards for stream crossings, infrastructure setbacks, erosion control measures, sediment controlling excavation/fill practices, and other best management practices. 3. Mitigation strategies specific to reconstruction, restoration, or replacement of the resource will occur, in close coordination with state and federal resource agencies, related to flood plains; surface waters, runoff, and erosion; and groundwater.
	Impacts on biological resources and wetlands	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices to maximize use of existing rights-of-way to minimize potential impacts on biological resources and wetlands.
		The project-level mitigation strategies include the following and would reduce this impact: 1. Avoidance and minimization measures will be incorporated into the development, design, and implementation phases. 2. Close coordination will occur with the regulatory agencies to develop specific design and construction standards for stream crossings, infrastructure setbacks, monitoring during construction, and other best management practices. 3. Mitigation strategies specific to reconstruction, restoration, or replacement of the resource will occur, in close coordination with state and federal resource agencies, related to wetlands. 4. Field studies will be conducted to verify the location, in relation to the HST alignments, of sensitive habitat, wildlife movement corridors, and wetlands. These studies will provide further opportunities to minimize and avoid potential impacts on biological resources through changes to the alignment plan and profile in sensitive areas. For example, the inclusion of design features such as elevated track structures over drainages and wetland areas and wildlife movement corridors will minimize potential impacts to wildlife and sensitive species.
	Impacts on Section 4(f) and 6(f) resources (public parks and recreational resources)	The program-level mitigation strategies include the following and would reduce this impact: 1. Incorporation of sound barriers (e.g., walls, berms, or trenches), visual buffers/landscaping, and modification of transportation access to/egress from the public lands and recreational resource. 2. Incorporation of design modifications or controls on construction schedules, phasing, and activities.

Resource Area	Impact Area	Mitigation Measure
		The project-level mitigation strategies include the following and would reduce this impact: 1. Beautification measures. 2. Replacement of land or structures or their equivalents on or near their existing site(s). 3. Tunneling, cut and cover, and cut and fill of right-of-ways. 4. Treatment of embankments. 5. Planting, screening, creating wildlife corridors, acquisition of land for preservation, and installation of noise barriers. 6. Establishment of pedestrian or bicycle paths. 7. Other potential mitigation strategies identified during the public input process.
		In the event that HST alignments or facilities are located within or in close proximity to public parks, the following mitigations for natural, cultural, aesthetic, and recreational impacts may be considered to offset the contribution to the cumulative impact, including but not limited to: 1. Compensation for temporary and loss of park and recreation use. 2. Recordation of any historic features removed. 3. If necessary, provide alternative shuttle access service to park visitors. 4. Restore directly impacted park lands to a natural state. 5. If any facilities must be relocated, provide planning studies as well as design and appropriate replacement with minimal impact on park use. 6. Inventory and record affected historic structures. Provide appropriate mitigation for adverse effects to historic structures. 7. Require appropriate vehicle cleaning for all construction equipment used near units of the California State Park System to protect against spreading exotic plants or disease. 8. Use local native plants for revegetation. 9. Design and construct cuts, fills, and aerial structures to avoid and minimize visual impact to units of the State Park System. 10. In addressing impacts to wildlife movement corridors and habitat directly related to California State Park System units, consult with the California Department of Parks and Recreation. 11. Incorporate wildlife under- or overcrossings as necessary. 12. Adopt construction practices to protect critical wildlife corridors and visitor use areas within public parks.

Duplicate

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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COMMUNITIES AND ECOSYSTEMS DIVISION

FAX TRANSMISSION COVER SHEET

FROM

Number of Pages (Including Fax Cover Sheet): 28

DATE: 4/6/09

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DEPARTMENT / OFFICE: CED-2

TO

NAME: Dan Leavitt

TELEPHONE NO: 916-324-1541

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DEPARTMENT / OFFICE: California High Speed Rail Authority

SUBJECT: Scoping Comments for San Francisco to San Jose Proposed High Speed Train EIR/EIS

F 3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Duplicate

April 6, 2009

David Valenstein
Federal Railroad Administration
1120 Vermont Avenue, NW, MS 20
Washington, D.C. 20590

Subject: Scoping Comments for San Francisco to San Jose Section of the Proposed High-Speed Train System Environmental Impact Statement/Environmental Impact Report

Dear Mr. Valenstein:

The United States Environmental Protection Agency (EPA) has reviewed the Federal Register Notice published December 29, 2008, requesting comments on the Federal Railroad Administration (FRA) and California High Speed Rail Authority (CHSRA) proposal to prepare a joint project Draft Environmental Impact Statement (Draft EIS) and Draft Environmental Impact Report (Draft EIR) for the San Francisco to San Jose section of the Proposed High-Speed Train (HST) System (Project). Our attached comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508) and Section 309 of the Clean Air Act.

We appreciate the close working relationship we have had with FRA and CHSRA as a cooperating agency on the previously completed statewide, programmatic, "Tier 1" EIS completed for an HST for California. We understand that project-level, "Tier 2" EISs have been initiated as a follow-up to the statewide analysis. If properly planned, EPA supports the concept of an HST system in California that can provide an alternative to increasing vehicle miles traveled and lead to reduced environmental impacts. We look forward to continuing our working relationship with you on the Tier 2 EISs and other Tier 2 project-level environmental analyses that will follow.

Through our previous comments on the statewide, programmatic EIS, EPA provided multiple recommendations and concerns to be addressed at the Tier 2 level. EPA also provided detailed comments on the HST Project Environmental Analyses Methodologies on May 14, 2008. Our detailed comments below include these, and other recommendations, related to continued interagency and community coordination, relationship of this Project to other regional transportation projects, land use and transportation linkages, and analysis of impacts to (1) noise, (2) energy resources, (3) air quality, (4) tunneling, (5) environmental justice communities, (6) water resources, (7) biological resources, and (8) invasive species. In addition, we have provided some recommendations for the cumulative impacts and growth inducement analysis for this

Project. We also recommend that FRA and CHSRA follow through with the mitigation measure commitments made in the statewide Tier 1 Final Programmatic EIS (see enclosure).

Interagency and Community Coordination

EPA commends the previous efforts of FRA and CHSRA in coordinating with our agency to highlight the potential environmental impacts of an HST system for all of California as outlined in our April 2003 Interagency Memorandum of Understanding (MOU). The MOU outlined a process for integrating the requirements of NEPA and Clean Water Act (CWA) Section 404 to streamline the environmental review process for the statewide "Tier 1" Programmatic Environmental Impact Statement (PEIS), which is now completed.

We understand that the proposed Project, connecting San Francisco to San Jose via HST, is the third project-level, "Tier 2" EIS to be initiated as a follow-up to the statewide analysis. For this, and all upcoming project-level EISs that tier off of the statewide programmatic document, EPA is available to continue to coordinate to discuss potential environmental concerns and solutions at the earliest possible opportunity.

Furthermore, methods to incorporate effective public participation into the NEPA process should be fully described and implemented early to better incorporate public concerns into the planning process. Where potential acquisition of property is proposed, an open, participatory process involving affected residents should be implemented.

Relationship to Regional Transportation Projects

The Draft EIS for the San Francisco to San Jose HST segment should specifically identify how the multiple proposed rail projects in the greater Bay Area relate to this Project. It is our understanding that the Metropolitan Transportation Commission (MTC), Bay Area Rapid Transit (BART), and Caltrain, along with a coalition of rail passenger and freight operators, have prepared a comprehensive Regional Rail Plan for the Bay Area, as required by the voters in the Regional Measure 2 (RM2) Traffic Congestion Relief Program (Final Report on September 26, 2007). EPA is supportive of FRA and CHSRA coordination with local transportation agencies to ensure that the Regional Rail Plan is integrated with the Bay Area to Central Valley HST system.

Coordination with local transportation agencies provides an opportunity to integrate high speed rail with plans for local service. EPA recommends FRA and CHSRA involvement in regional projects in order to minimize duplication of efforts and conflicting transit goals so that potential design, construction, permitting, and mitigation in the area can be streamlined to minimize environmental impacts.

Recommendations:

- Address how the proposed Project will insure that potential duplication of efforts and incompatibilities will not occur.
- Identify integration and/or incompatibility of projects.

- Identify the specific design features of this proposal that are being designed to "link up" with the other transportation, commuting and transit proposals in the region.

- Clarify whether the facilities constructed for the Caltrain Electrification Program were designed to accommodate power distribution requirements for a future HST system. Address how the proposed project will be integrated with the operation of the "Baby Bullet" express service and pedestrian and bicycle access improvements.

Land Use and Transportation Linkage

The Draft EIS should identify all transportation improvements proposed to provide access to the proposed facilities from anticipated key rider groups in the Bay Area and surrounding population centers, including transit connections, new methods to move people while reducing congestion, and increased bus service (express service, increase in service on existing routes, and new routes). The Draft EIS should analyze and disclose the temporary and permanent environmental impacts of constructing stations, parking facilities, maintenance and storage facilities, power propagation infrastructure, and required road developments and modifications. Because the project system is planned along the existing Caltrain corridor, the Draft EIS should describe, in detail, the specific modifications to the existing rail network and rail crossings required to be compatible with an HST system.

The Draft EIS should also demonstrate avoidance and minimization measures to reduce environmental impacts associated with the construction of passenger stations and maintenance facilities, such as multi-level parking structures as opposed to large expansive parking lots. The Draft EIS should identify where proposed stations, parking facilities, and additional required infrastructure will be located in the project corridor, and should disclose the associated impacts from station development on planned and unplanned growth.

Recommendations:

- Describe the expected land use changes associated with station locations.

- Describe the associated environmental impacts of those land use changes, both indirect and cumulative.

- Identify how access to the HST system will be integrated with the existing Caltrain system and describe, in detail, the specific modifications to the existing rail network and rail crossings required to be compatible with an HST system.

- Identify parties responsible for mitigating the environmental impacts associated with the indirect and cumulative impacts of the projected land use changes.

- Identify the timeline for improvements and maintenance.

A substantial benefit of a proposed high speed rail corridor connecting San Francisco to San Jose is the opportunity to provide improved transit services and to reduce vehicle miles

traveled (VMT). EPA strongly supports including project elements that will further reduce VMT.

Recommendations:

- Minimize the number of parking spaces to the greatest extent possible at the station in order to facilitate the use of transit;
- Coordinate with other transit providers to maximize station access by transit;
- Design the new facilities to be pedestrian and bicycle-friendly, in addition to linking with other modes of transit; and
- Support policies that will increase density and mixed-uses in the station areas.

Noise Impacts

The Draft EIS should address the potential noise and vibration impact to residents, businesses, and wildlife related to the construction and operation of the proposed Project. Potential impacts to human health and welfare and wildlife activity are important with a project of this magnitude, particularly in light of the densely populated area and maximum speed and resulting sounds and vibrations that the HST will produce throughout the train route.

Recommendations:

- All noise impacts to should be fully analyzed and presented in the Draft EIS. In addition, the Draft EIS should include commitments to implement measures to adequately mitigate noise impacts associated with the Project. The Draft EIS should assess noise and vibration exposure to determine the severity of impacts near the proposed HST route.
- The Draft EIS should address nocturnal and diurnal impacts to wildlife activities such as foraging, predator avoidance, and nesting that may be affected by new sounds and vibrations introduced to natural habitats.

Energy Resources

It is our expectation that the HST project will increase annual electricity use and decrease use of diesel fuel and gasoline. Successful implementation of the proposed project depends on the availability of sufficient sources of energy. The Draft EIS should identify the number and capacity of energy facilities that were either operational or under construction as of 2008 and discuss whether the future supply is expected to be adequate to meet growth in demand, given the number of power plants in the pipeline or in planning. The energy analysis should take into consideration the cumulative impact of other planned projects that will also increase demand on the existing energy supply.

Duplicate

Recommendations:

- Identify the number and capacity of energy facilities that were either operational or under construction as of 2008 and discuss whether the future supply is expected to be adequate to meet growth in demand, given the number of power plants in the pipeline or in planning.

- Discuss the cumulative impact of other planned projects that will also increase demand on the existing energy supply. Reasonably foreseeable projects include: (1) the extension of Bay Area Rapid Transit to Warm Springs, San Jose and Santa Clara, (2) the extension of light rail projects in San Jose, and (3) Dumbarton Rail Corridor.

Air Quality

The Draft EIS should provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS), criteria pollutant nonattainment areas, and potential air quality impacts of the project (including cumulative and indirect impacts) for each fully evaluated alternative.

The San Francisco Bay Area is federally designated marginal nonattainment for the 8-hour ozone standard. Because of the area's nonattainment status, it is important to reduce emissions of ozone precursors resulting from the project.

Recommendations:

- Provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS), criteria pollutant nonattainment areas, and potential air quality impacts of the project (including cumulative and indirect impacts) for each alternative.

- Include a thorough analysis of impacts from the construction and operation of the proposed alternatives. Include monitoring data, any anticipated exceedances of NAAQS, and estimates of all criteria pollutant emissions, including the federal 8-hour ozone standard and the $PM_{2.5}$ standard.

- Disclose the available information about the health risks associated with vehicle emissions, sensitive receptors in the vicinity of the project area, and how the proposed project will affect current emission levels.

- Work with the Bay Area Air Quality Management District (BAAQMD), Caltrans, and MTC to ensure that methods to estimate emissions and anticipated emissions values from the proposed project are consistent with Air Quality Management Plan and Regional Transportation Plan (RTP) conformity determinations.

- Use the most current EPA-approved model to estimate emissions, including re-entrained PM-10 emissions and present all methods and assumptions for analyses with pertinent air quality analyses and conclusions.

- Include an identification of potential hotspot impacts, especially where parking lots, idling locomotives, idling buses, and road modifications are proposed

General Conformity and Transportation Conformity

The proposed Project may require a general conformity determination by FRA. If required, the Draft EIS should include the general conformity determination with related mitigation commitments. FRA and CHSRA should work with BAAQMD to ensure that anticipated emissions from the proposed project are consistent with the Air Quality Management Plan.

To the extent that the proposed train system will require modification of the existing grade crossings, road network and construction of parking lots and transit facilities, the Draft EIS should identify what elements of this project will require funding or approval by the Federal Highway Administration (FHWA) or Federal Transit Administration (FTA). In addition, the Draft EIS should demonstrate that FHWA or FTA -funded or -approved project elements are included in a conforming transportation plan and a transportation improvement program. FRA and CHSRA should work with BAAQMD and the MTC to ensure that applicable elements of the proposed project are consistent with future revisions of the RTP. The identification of sensitive receptors, and carbon monoxide and particulate matter hotspot analyses should be included in the Draft EIS, especially where parking lots and road modifications are proposed.

Construction Mitigation Measures

The proposed Project will involve construction and staging along a heavily populated corridor. Because of the multiple receptors along the corridor, FRA and CHRSA should identify and commit to specific requirements to reduce emissions.

The Draft EIS should include BAAQMD requirements to reduce emissions. In addition to these measures, EPA recommends the following additional measures to reduce the impacts resulting from future construction associated with this project.

Recommendations:

In light of the serious health impacts associated with $PM_{2.5}$ (fine particulate matter) and diesel exhaust exposure, we recommend that the best available control measures for these pollutants be implemented at all times and recommend that a Construction Emissions Mitigation Plan is incorporated into the Draft EIS. We recommend that all requirements under BAAQMD Guidelines (BAAQMD, 1999), and the following additional measures be incorporated into a Construction Emissions Mitigation Plan, where feasible and appropriate, in order to reduce impacts associated with fugitive dust and emissions of $PM_{2.5}$, diesel exhaust, and mobile source air toxics from construction-related activities:

Fugitive Dust Source Controls:

- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.

- When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

Mobile and Stationary Source Controls:

- Minimize use, trips, and unnecessary idling of heavy equipment.

- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, where applicable, and to perform at verified standards applicable to retrofit technologies. Employ periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications. The California Air Resources Board has a number of mobile source anti-idling requirements which could be employed. See their website at: http://www.arb.ca.gov/msprog/truck-idling/truck-idling.htm

- Prohibit any tampering with engines and require continuing adherence to manufacturer's recommendations.

- If practicable, lease new, clean equipment meeting the most stringent of applicable Federal or State Standards. In general, commit to the best available emissions control technology. Tier 4 engines will be available in the 2009-model year and should be used for project construction equipment to the maximum extent feasible. Lacking availability of non-road construction equipment that meets Tier 4 engine standards, FRA/CHSRA should commit to using the best available emissions control technologies on all equipment.

- Utilize EPA-registered particulate traps and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site.

Administrative controls:

- Specify the means by which impacts to sensitive receptors, such as children, elderly, infirm and others identified in the Draft EIS, will be minimized. For example, locate construction equipment and staging zones away from sensitive receptors and fresh air intakes to buildings and air conditioners.

- Identify where implementation of mitigation measures is rejected based on economic infeasibility. Provide the justification behind not committing to all mitigation measures. Should FRA and CHSRA determine that potential mitigation measures are not economically feasible, the Draft EIS should provide the context behind this decision.

- Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking. (Suitability of control devices is based on: whether there is reduced normal

availability of the construction equipment due to increased downtime and/or power output, whether there may be significant damage caused to the construction equipment engine, or whether there may be a significant risk to nearby workers or the public.) Meet EPA diesel fuel requirements for off-road and on-highway, and, where appropriate, use alternative fuels such as natural gas and electric.

Greenhouse Gases

Due to the nature of this Project and the potential greenhouse gases (GHG) benefits that could result, we believe the Project proponents have an opportunity to demonstrate the potential overall GHG benefits of such a project. There are many guidance documents available or expected to be available in the near future.

EPA is available to coordinate regarding analysis of GHGs. Please refer to our detailed comments on the HST Project Environmental Analyses Methodologies for further recommendations on the analysis of GHG emissions in the project level EISs.

Additionally, EPA recommends the Draft EIS should ultimately identify the cumulative contributions and reductions to GHG emissions that will result from implementation of the Project. We also recommend that the project level EIS discuss the potential impacts of climate change on the Project. Finally, the project level EIS should identify if there are specific mitigation measures needed to 1) protect projects from the effects of climate change, 2) reduce the Project's adverse air quality effects, and/or 3) promote pollution prevention or environmental stewardship. Any design and operation measures that can be identified as reducing GHGs should be identified in the EISs with an estimate of the GHG emissions reductions that would result if measures were ultimately implemented.

Tunneling Methodology and Impacts

As applicable, the Draft EIS should identify the amount of material to be removed per mile of tunnel and where material will be disposed or stored. Any impacts associated with the transport and storage of fill should be described and mitigated. Discuss the tunneling methodology to be utilized and the corresponding environmental impacts. Identify specific design measures and options to insure that the full scope of environmental impacts associated with tunneling are considered in project design.

Recommendations:

- Discuss the methodology proposed for any alternative design that involves tunneling, including equipment and planned locations for staging tunnel operations and methods for transportation of tunnel equipment.

- Quantify the environmental impacts associated with the tunneling and required connected actions, for example amount of material removed per mile tunnel, impacts associated with storage of removed material, road access required, impacts associate with the transport of removed material, etc.

- Discuss the potential impacts of tunneling on the existing transportation network.

- Address the potential for tunneling to affect stream flows, riparian habitat, the direction of lateral movement of water through the soil profile, and the recharge of shallow, unconfined aquifers.

Cumulative Impact Analysis

Cumulative impacts are defined in the Council on Environmental Quality's (CEQ) NEPA regulations as the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR 1508.7). The cumulative impacts analysis should provide the context for understanding the magnitude of the impacts of the alternatives by analyzing the impacts of other past, present, and reasonably foreseeable projects or actions and then considering those cumulative impacts in their entirety. These actions include both transportation and non-transportation activities. Where adverse cumulative impacts are identified, the Draft EIS should disclose the parties that would be responsible for avoiding, minimizing, and mitigating those adverse impacts (CEQ's Forty Most Frequently Asked Questions #19).

Recommendations:

- The cumulative impact analysis should consider transportation and non-transportation projects such as large-scale developments and approved urban planning projects that are reasonably foreseeable and are identified within city and county planning documents.

- The cumulative impact analysis should describe the "identifiable present effects" to various resources attributed to past actions. The purpose of considering past actions is to determine the current health of resources. This information forms the baseline for assessing potential cumulative impacts and can be used to develop cooperative strategies for resources protection (CEQ's Forty Most Frequently Asked Questions #19). Identify the current condition of the resource as a measure of past impacts. For example, the percentage of wetlands lost to date.

- Identify the future condition of the resource based on an analysis of the cumulative impacts of reasonably foreseeable projects or actions added to existing conditions and current trends. Identify the trend in the condition of the resource as a measure of present impacts. For example, the health of the resource is improving, declining, or stasis.

- The cumulative impact analysis should identify potential large, landscape-level statewide and regional impacts, as well as potential large-scale mitigation measures. The analysis should examine landscape-level impacts to the human and natural environment on a statewide and regional scale. The cumulative impact analysis should guide minimization measures and mitigation efforts. Disclose the parties that will be responsible for avoiding, minimizing, and mitigating impacts, as well as a timeline for implementing mitigation measures.

- EPA recommends that FRA and CHSRA use Caltrans recently published cumulative impacts guidance, which is applicable to cumulative impact analyses for non-road projects. This guidance can be found at [http://www.dot.ca.gov/ser/cumulative_guidance/purpose.htm].

Growth Inducing Analysis

EPA recommends making both the methodology and the assumptions in the growth inducing analysis as transparent as possible to the public and decision makers.

Recommendations:

- Identify which land use model will be used, discuss its strengths and weaknesses, and describe why it was selected.

- Identify the assumptions used in the model, the strengths and weaknesses of the assumptions, and why those assumptions were selected. For example, describe which method will be used to allocate growth to analysis zones, its strengths and weaknesses, and why that method was selected.

- Ground truth the results of the land use model by enlisting local expertise involved in land use issues, such as local government officials, land use and transportation planners, home loan officers, and real estate representatives. Use their collective knowledge to validate or modify the results of the land use model.

- Use the results of the growth inducing analysis to inform station locations, and parking lot size and locations, as well as mitigation measures to reduce environmental impacts.

- Identify station locations that are currently zoned for high density development and those that are not. Address potential growth-related mitigation efforts, including incentives for transit-oriented development, measures to increase the capacity of city/county planning efforts, and mechanisms to encourage transit oriented development.

- Use FHWA and Caltrans recently published growth-related impacts guidance, which is applicable to growth-related impact analyses for non-road projects outside of California. This guidance can be found at [http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/gri_guidance.htm].

Environmental Justice

Executive Order 12898 addresses Environmental Justice in minority and low income populations, and the Council on Environmental Quality has developed guidance concerning how to address Environmental Justice in the environmental review process (http://ceq.eh.doe.gov/nepa/regs/ej/justice.pdf).

Duplicate

Recommendations:

- Identify how the proposed alternatives may affect the mobility of low-income or minority populations in the surrounding area.

- Provide specific, appropriate mitigation measures for any anticipated adverse impacts to community members.

- Include opportunities for incorporating public input to promote context sensitive design, especially in Environmental Justice communities.

Water Resources

The Clean Water Act Section 404(b)(1) Guidelines (Guidelines) at 40 CFR Part 230.10(a) state that ". . .no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." While EPA has concurred that the HST alternative alignments identified in the Final Bay Area to Central Valley Programmatic EIS are "most likely to contain" the least environmentally damaging practicable alternative (LEDPA), FRA and CHSRA will have to demonstrate in the Draft EIS for this Project that potential impacts to waters of the United States have been avoided and minimized to the maximum extent practicable prior to obtaining a CWA Section 404 permit (40 CFR 230.10(a) and 230.10(d)).

Recommendations:

- In the Draft EIS for the San Francisco to San Jose HST Project, follow through with commitments made in the statewide Tier 1 Final Programmatic EIS (Final PEIS), specifically "Avoidance and minimization measures would be incorporated into the development, design, and implementation phases at project-level environmental analysis. In addition, close coordination will occur with the regulatory agencies to develop specific design and construction standards for stream crossings, infrastructure setbacks, monitoring during construction, and other best management practices" (Final PEIS, Page 3.17-25).

- Ensure the mitigation measures as listed in the table starting on page 3.17-28 of the Final PEIS are incorporated in the Draft EIS (see enclosure).

- Demonstrate that all potential impacts to waters of the United States have been avoided and minimized. If these resources cannot be avoided, the Draft EIS analyses should clearly demonstrate how cost, logistical, or technological constraints preclude avoidance and minimization of impacts.

- Identify design measures and modifications to avoid and minimize impacts to water resources. Quantify the benefits achieved for each alternative studied, for example, number of stream crossings avoided, acres of waters of the United States avoided, etc.

- Identify all protected resources with special designations and all special aquatic sites and waters within state, local, and federal protected lands. Additional steps should be taken to avoid and minimize impacts to these areas.

Biological Resources

EPA is supportive of FRA and CHSRA previous commitments in the statewide Tier 1 Final PEIS that "project-level studies will identify areas where it is important to maintain connectivity and will ensure that sufficient mitigation is included to maintain movement corridors," and "wildlife underpasses or overpasses will be added to the (HST) at-grade alignments, where appropriate, to reduce the overall effects on wildlife corridors and movements" (Final PEIS Appendix 2, Chapter 9, Standard Response 3.15.9). EPA provides the following recommendations to be implemented by FRA and CHSRA for the Draft EIS. Much of the information identified below is now available for FRA and CHSRA to use in landscape-level analyses, and up-front data compilation and coordination with species experts prior to initiation of project-level planning will contribute to a better understanding of the measures needed to reduce impacts to biological resources.

Recommendations:

- Incorporate information developed for the California Missing Linkages Report and identify how alternatives have been designed to allow for continued wildlife movement:
  http://scwildlands.org/missinglinks/reports/download_missinglinkages.htm

- Use data developed for the statewide California Wildlife Action Plan (CWAP) to inform the siting of alternatives and mitigation ideas. Identify in the Draft EIS the specific design changes proposed to avoid resources. The CWAP addresses 800 at-risk species and provides range maps. The range maps for these species are available from the California Department of Fish and Game.
  http://www.dfg.ca.gov/habitats/WDP/

- In addition to locating the available data indicating where species ranges may be bisected by the HST system, EPA recommends that FRA and CHSRA facilitate a meeting of scientists and local experts to explore the specific locations and design features for wildlife crossings that are needed.

- Identify the connections that would likely remain after construction of the HST system and highlight these areas as "connectivity zones" for protection and preservation. In the Draft EIS, identify specific commitments for preservation of these corridors through mitigation measures and cooperative agreements.

- Disclose how fencing the train route will affect wildlife movement and discuss how fencing for safety purposes will be integrated with proposed wildlife passages, such as culverts, bridges, viaducts, underpasses, and overpasses.

Duplicate

Invasive Species

The proposed Project may include impacts to vegetation within the existing right-of-way and mitigation is proposed as a result of ground disturbance and tree removal. Executive Order 13112 on Invasive Species calls for the restoration of native plant and tree species.

Recommendation:

- To the extent that this project will entail new landscaping and tree replacement, the mitigation measures should describe how the project will meet the requirements of Executive Order 13112 by using native species. Replacement of trees and revegetation should be coordinated with appropriate city and county urban foresters and native species should be utilized where feasible.

We look forward to maintaining our working relationship with FRA and CHSRA as we continue to coordinate on a proposed HST system for California. If you have any questions, please feel free to contact Connell Dunning, Transportation Team Leader, at 415-947-4161, or Tom Plenys, the lead reviewer for this project. Tom can be reached at 415-972-3238 or plenys.thomas@epa.gov.

Sincerely,

Tom Plenys
Environmental Review Office

Enclosure: Mitigation Strategies, Bay Area to Central Valley HST Final Program EIR/EIS

CC: Dan Leavitt, California High Speed Rail Authority
Mehdi Morshed, California High Speed Rail Authority
Jane Hicks, Army Corps of Engineers
Robert Smith, Army Corps of Engineers
Mark Littlefield, U.S. Fish and Wildlife Service
Susan K. Moore, U.S. Fish and Wildlife Service
Ray Sukys, Federal Transit Administration
Gary Sweeten, Federal Highway Administration
Marie Pang, Peninsula Corridor Joint Powers Board
Lindy Lowe, San Francisco Bay Conservation and Development Commission
Scott Wilson, California Department of Fish and Game
James B. Richards, Caltrans

Resource Area	Impact Area	Mitigation Measure
Traffic and circulation	Traffic and circulation	Require that HST system stations serve as multi-modal transportation hubs providing easy connection to local/regional bus, rail, and transit services, as well as providing bicycle and pedestrian access.
		Require the HST system to be grade-separated from all roadways to allow vehicular traffic to flow without impediment from the HST system.
		Work with local and regional agencies to develop and implement transit-oriented development strategies, as described in Chapter 6, around HST stations.
		Work with local and regional agencies to identify, plan, coordinate, and implement traffic flow improvements around HST station locations during project-level planning. Such improvements may include: a. a construction phasing and traffic management plan for construction periods; b. improving capacity of local streets with upgrades in geometrics such as providing standards roadway lane widths, traffic controls, bicycle lanes, shoulders, and sidewalks; c. modifications at intersections, such as signalization and/or capacity improvements (widening for additional left-turn and/or through lanes), and turn prohibitions; d. signal coordination and optimization (including retiming and rephasing); e. designation of one-way street patterns near some station locations; f. truck route designations; and g. coordination with Caltrans regarding nearby highway facilities.
		Work with public transportation providers to coordinate services and to increase service and/or add routes, as necessary, to serve the HST station areas.
		Avoid parking impacts by developing and coordinating implementation at the project-level of parking improvement strategies consistent with local policies, including shared parking, offsite parking with shuttles, parking and curbside use restrictions, parking permit plans for neighborhoods near HST stations, and other parking management strategies.
Air quality	Localized air quality impacts due to congestion/traffic near HST stations	Assure that HST stations are multi-modal hubs and include appropriate parking.
		Coordinate with local and regional public transportation providers to increase opportunities for connection between the HST system and other public transportation services.
		Work with local and regional agencies to implement local street and roadway improvements, including various traffic flow improvements and congestion management techniques, and parking management strategies to reduce localized pollution from traffic related to the HST system.
	Short-term air quality impacts due to construction	Water all active construction areas at least twice daily.
		Require that all trucks hauling soil, sand, and other loose materials be covered or maintain at least 2 feet of freeboard.
		Pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at active construction sites.
		Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at active construction sites.
		Sweep nearby streets daily (with water sweepers) if visible soil materials from HST system construction are carried onto adjacent public streets.
		Hydroseed or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
		Enclose, cover, water twice daily, or apply nontoxic soil binders to exposed stockpiles of dirt, sand, etc.
		Limit traffic speeds on unpaved roads to 15 mph.

Duplicate

Resource Area	Impact Area	Mitigation Measure
		Install sand bags or other erosion control measures to prevent silt runoff to public roads.
		Replant vegetation in disturbed areas as quickly as possible.
		Use alternative fuels for construction equipment when feasible.
		Minimize equipment idling time.
		Maintain properly tuned equipment.
Noise	Increased noise from train operations and construction	Grade separations to eliminate grade crossing related noise.
		Noise barriers, such as sound walls, where there are severe noise impacts.
		Require noise reduction in HST equipment design and track structures design.
		Use of enclosures or walls to surround noisy equipment, and installation of mufflers on engines; substituting quieter equipment or construction methods, minimizing time of operation, and locating equipment farther from sensitive receptors.
		Where not already included, consider placing alignment sections in tunnel or trenches or behind berms where possible and where other measures are not available to reduce significant noise impacts.
		Suspend construction between 7:00 pm and 7:00 am and/or on weekends or holidays in residential areas where there are severe noise impacts.
		In managing construction noise, take into account local sound control and noise level rules, regulations, and ordinances.
		Ensure that each internal combustion engine is equipped with a muffler of a type recommended by the manufacturer.
		Specify the use of the quietest available construction equipment where appropriate and feasible.
		Turn off construction equipment during prolonged periods of nonuse.
		Require contractors to maintain all equipment and to train their equipment operators.
		Locate noisy stationary equipment away from noise sensitive receptors.
	Exposure to ground-borne vibration	Specify the use of train and track technologies that minimize ground vibration such as state of the art suspensions, resilient track pads, tie pads, ballast mats, or floating slabs.
		Phase construction activity, use low impact construction techniques, and avoid use of vibrating construction equipment where possible to avoid vibration construction impacts.
Energy	Increased energy use and electricity demand with the HST system	HST stations will be multi-modal hubs providing linkage for various transportation modes, which will contribute to increased efficiency of energy use for intercity trips and by commuters, and the stations will be required to be constructed to meet Title 24 California Code of Regulations energy efficiency standards.
		Design practices will require that the electrically powered HST technology be energy efficient, include regenerative braking to reduce energy consumption, and minimize grade changes in steep terrain to reduce energy consumption.
		Design practices will require that localized impacts be avoided through planning and design of the power distribution system for the HST system.
		Locate HST maintenance and storage facilities within proximity to major stations/termini.
	Energy use during construction of the HST system	Develop and implement a construction energy conservation plan.
		Use energy efficient construction equipment and vehicles.
		Locate construction material production facilities on site or in proximity to project construction sites.

Resource Area	Impact Area	Mitigation Measure
		Develop and implement a program encouraging construction workers to carpool or use public transportation for travel to and from construction sites.
Electromagnetic fields and electromagnetic interference	Exposure of electromagnetic fields to HST system workers, passengers, and nearby residents, schools and other facilities	Use standard design practices for overhead catenary power supply systems and vehicles, including appropriate materials, location and spacing of facilities, and power supply systems to minimize exposure to receptors over distance, and shielding with vegetation and other screening materials.
		Design overhead catenary system, substations, and transmission lines to reduce the electromagnetic fields to a practical minimum.
	Electromagnetic interference with electronic and electrical devices	Design the overhead catenary system, substations, and transmission lines to reduce the electromagnetic fields to a practical minimum.
		Design the project component to minimize arcing and radiation of radiofrequency energy.
		Choose devices generating radio frequency with a high degree of electromagnetic compatibility.
		Where appropriate, add electronic filters to attenuate radio frequency interference.
		Relocate receiving antennas and use antenna models with greater directional gain where appropriate, particularly for sensitive receptors near the HST system.
		Comply with the FCC regulations for intentional radiators, such as the proposed HST wireless systems.
		Establish safety criteria and procedures and personnel practices to avoid exposing employees with implantable medical devices to EMF levels that may cause interference with such implanted biomedical devices.
Land use	Incompatibility with land uses and disruption to communities	Continue to apply design practices to minimize property needed for the HST system and to stay within or adjacent to existing transportation corridors to the extent feasible.
		Work with local governments to consider local plans and local access needs, and to apply design practices to limit disruption to communities.
		Work with local governments to establish requirements for station area plans and opportunities for transit-oriented development.
		Work with local governments to enhance multi-modal connections for HST stations.
		Coordinate with cities and counties to ensure that HST facilities will be consistent with land use planning processes and zoning ordinances.
		Provide opportunities for community involvement early in project-level studies.
		Hold design workshops in affected neighborhoods to develop understanding of vehicle, bicycle, and pedestrian linkages in order to preserve those linkages through use of grade-separated crossings and other measures.
		Ensure that connectivity is maintained across the rail corridor (pedestrian/bicycle and vehicular crossings) where necessary to maintain neighborhood integrity.
		Develop facility, landscape, and public art design standards for HST corridors that reflect the character of adjacent affected neighborhoods.
		Maintain high level of visual quality of HST facilities in neighborhood areas by implementing such measures as visual buffers, trees and other landscaping, architectural design, and public artwork.
	Impacts to neighborhoods during construction	Develop a traffic management plan to reduce barrier effects during construction.
		To the extent feasible, maintain connectivity during construction.
Agricultural	Conversion of	Avoid farmland whenever feasible during the conceptual design stage of the project.

Resource Area	Impact Area	Mitigation Measure
lands	prime, statewide important, and unique farmlands, and farmlands of local importance, to project uses	Reduce the potential for impacts by sharing existing rail rights-of-way where feasible or by aligning HST features immediately adjacent to existing rail rights-of-way.
		Reduce the potential for impacts by reducing the HST right-of-way width to 50 feet in constrained areas.
		Increase protection of existing important farmlands by securing easements or participating in mitigation banks.
		Coordinate with and support the California Farmland Conservancy Program to secure conservation easements on farmland in geographic areas where the HST project creates impacts.
		Coordinate with private agricultural land trusts, local programs, mitigation banks, and Resource Conservation Districts to identify additional measures to limit important farmland conversion or provide further protection to existing important farmland.
	Severance of prime, statewide important, and unique farmlands, and farmlands of local importance, to project uses	Avoid farmland whenever feasible during the conceptual design stage of the project.
		Minimize severance of agricultural land by constructing underpasses and overpasses at reasonable intervals to provide property access.
		Work with landowners during final design of the system to enable adequate property access.
		Provide appropriate severance payments to landowners.
Aesthetics and visual resources		At the project-level, design proposed facilities that are attractive in their own right and that will integrate well into landscape contexts, so as to reduce potential view blockage, contrast with existing landscape settings, light and shadow effects, and other potential visual impacts.
		Design bridges and elevated guideways with graceful lines and minimal apparent bulk and shading effects.
		Design elevated guideways, stations, and parking structures with sensitivity to the context, using exterior materials, colors, textures, and design details that are compatible with patterns in the surrounding natural and built environment, and that minimize the contrast of the structures with their surroundings.
		Use neutral colors and dulled finishes that minimize reflectivity for catenary support structures, and design them to fit the context of the specific locale.
		Use aesthetically appropriate fencing along rights-of-way, including decorative fencing, where appropriate, and use dark and non-reflective colors for fencing to reduce visual contrast.
		Where at-grade or depressed route segments pass through or along the edge of residential areas or heavily traveled roadways, install landscape treatments along the edge of the right-of-way to provide partial screening and to visually integrate the right-of-way into the residential context.
		Use the minimum amount of night lighting consistent with that necessary for operations and safety.
		Use shielded and hooded outdoor lighting directed to the area where the lighting is required, and use sensors and timers for lights not required to be on all the time.
		Design stations to minimize potential shadow impacts on adjacent pedestrian areas, parks, and residential areas, and site all structures in a way that minimizes shadow effects on sensitive portions of the surrounding area.
		Seed and plant areas outside the operating rail trackbed that are disturbed by cut, fill, or grading to blend with surrounding vegetated areas, where the land will support plants. Use native vegetation in appropriate locations and densities.

Duplicate

Resource Area	Impact Area	Mitigation Measure
		Use strategic plantings of fast-growing trees to provide partial or full screening of elevated guideways where they are close to residential areas, parks, and public open spaces.
		Where elevated guideways are located down the median strips or along the edge of freeways or major roadways, use appropriate landscaping of the area under the guideway to provide a high level of visual interest. Landscaping in these areas should use attractive shrubs and groundcovers and should emphasize the use of low-growing species to minimize any additional shadow effects or blockage of views.
		Plan hours of construction operations and locate staging sites to minimize impacts to adjacent residents and businesses.
Public utilities		Make adjustments to the HST alignments and vertical profiles to avoid crossing or using major utility right-of-way or fixed facilities during engineering design.
		If avoidance is not feasible, in consultation and coordination with the utility owner, relocate or protect in-place transmission lines, substations, and any other affected facilities.
		For acquisition projects which result in utility relocation, follow the uniformity and equitable treatment policies, and comply with the requirements, of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 for all property necessary for the proposed HST system.
Hazardous materials and wastes		Investigate soils and groundwater for contamination and prepare environmental site assessments when necessary.
		Design realignment of the HST corridors to avoid identified sites.
		Relocate HST associated facilities such as stations to avoid identified sites.
		Remediate identified hazardous materials and hazardous waste contamination.
		Prior to demolition of buildings for project construction, survey for lead-based paint and asbestos-containing materials.
		Follow BMPs for testing, treating, and disposing of water, and acquire necessary permits from the regional water quality control board, if ground dewatering is required.
		When indicated by project-level environmental site assessments, perform Phase II environmental site assessments in conformance with the ASTM Standards related to the Phase II Environmental Site Assessment Process to identify specific mitigation measures.
		Prepare a Site Management Program/Contingency Plan prior to construction to address known and potential hazardous material issues, including: a. measures to address management of contaminated soil and groundwater; b. a site-specific Health and Safety Plan (HASP), including measures to protect construction workers and general public; and c. procedures to protect workers and the general public in the event that unknown contamination or buried hazards are encountered.
		As part of the second-tier environmental review, consider impacts to the environment on sites identified on the Cortese list (Government Code Section 65962.4) at that time.
Cultural and paleontological resources	Impacts to archaeological resources and traditional cultural properties	Avoid the impact, or when avoidance cannot be accommodated, minimize the scale of the impact.
		Incorporate the site into parks or open space.
		Provide data recovery for archaeological resources, which may include excavation of an adequate sample of the site contents so that research questions applicable to the site can be addressed.

Resource Area	Impact Area	Mitigation Measure
		Develop procedures for fieldwork, identification, evaluation, and determination of potential effects to archaeological resources in consultation with SHPO and Native American tribes. Procedures may include onsite monitoring when sites are known or suspected of containing Native American human remains and be reflected in Memoranda of Agreement with appropriate bodies.
		Coordinate and consult with tribal representatives.
	Impacts to historic properties/ resources	Avoid the impact through project design. Prepare and utilize a treatment plan for protection of historic properties/resources that will describe methods to preserve, stabilize, shore/underpin, and monitor buildings, structures, and objects.
		Avoid high vibration construction techniques in sensitive areas.
		Record and document cultural resources that would be adversely affected by the project to the standards of the Historic American Building Survey or Historic American Engineering Record.
		Develop design guidelines to ensure sympathetic, compatible, and appropriate designs for new construction.
		Consult with architectural historians or historical architects to advise on appropriate architectural treatment of the structural design of proposed new structures. Prepare interpretive and/or educational materials and programs regarding the affected historic properties/resources. Materials may include: a popular report, documentary videos, booklets, and interpretive signage.
		Make interpretive information available to state and local agencies, such as salvage items, historic drawings, interpretive drawings, current and historic photographs, models, and oral histories. Also assist with archiving and digitizing the documentation of the cultural resources affected and disseminating material to the appropriate repositories.
		Relocate and rehabilitate historic properties/resources that would otherwise be demolished because of the project.
		Monitor project construction to ensure it conforms to design guidelines and any other treatment procedures agreed to by the parties consulting pursuant to Section 106 of the National Historic Preservation Act. Repair inadvertent damage to historic properties/resources in accordance with the Secretary of the Interior's Standards for Treatment of Historic Properties.
		Salvage selected decorative or architectural elements of the adversely affected historic properties/resources, and retain and incorporate salvaged items into new construction where possible. If reuse is not possible, make salvaged items available for use in interpretive displays near the affected resources or in an appropriate museum.
		Implement an agreement with appropriate bodies specifying procedures for addressing historic resources which may be affected by the HST system.
	Impacts to paleontological resources	Educate workers.
		Recover fossils identified during the field reconnaissance.
		Monitor construction.
		Develop protocols for handling fossils discovered during construction, such as temporary diversion of construction equipment so that the fossils could be recovered, identified, and prepared for dating, interpreting, and preserving at an established, permanent, accredited research facility.
Geology and soils	Seismic hazards	Design structures to withstand anticipated ground motion, using design options such as redundancy and ductility.
		Prevent liquefaction and resulting structural damage and traffic hazards using: 1. ground modification techniques such as soil densification; and 2. structural design, such as deep foundations.

Resource Area	Impact Area	Mitigation Measure
		Utilize motion sensing instruments to provide ground motion data and a control system to temporarily shut down HST operations during or after an earthquake to reduce risks.
		Design and engineer all structures for earthquake activity using Caltrans Seismic Design Criteria.
		Design and install foundations resistant to soil liquefaction and settlement.
		Identify potential serpentinite bedrock disturbance areas and implement a safety plan.
		Apply Section 19 requirements from the most current Caltrans Standard Specifications to ensure geotechnically stable slopes are planned and created.
		Install passive or active gas venting systems and gas collection systems in areas where subsurface gases are identified.
		Remove corrosive soil and use corrosion protected materials in infrastructure.
		Address erosive soils through soil removal and replacement, geosynthetics, vegetation, and/or riprap, where warranted.
		Remove or moisture condition shrink/swell soils.
		Utilize stone columns, grouting, and deep dynamic compaction in areas of potential liquefaction.
		Utilize buttress berms, flattened slopes, drains, and/or tie-backs in areas of slope instability.
		Avoid settlement through preloading, use of stone columns, deep dynamic compaction, grouting, and/or special foundation designs.
	Surface rupture hazards	Install early warning systems triggered by strong ground motion associated with ground rupture, such as linear monitoring systems (i.e., time domain reflectometers) along major highways and rail lines within the zone of potential rupture to provide early warnings and allow for temporary control of rail and automobile traffic to avoid and reduce risks.
		Continue to modify alignments to avoid crossing known or mapped active faults within tunnels.
		Avoid active faults to the extent possible. Where avoidance is not possible, cross active faults at grade and perpendicular to the fault line.
	Slope instability	Install temporary and permanent slope reinforcement and protection, based on geotechnical investigations, and review of proposed earthwork and foundation excavation plans.
		Conduct geotechnical inspections during construction to verify that no new unanticipated conditions are encountered.
		Incorporate slope monitoring in final design.
	Difficulty in excavation	Identify areas of potentially difficult excavation to ensure safe practices.
		Focus future geotechnical engineering and geologic investigations in areas of potentially difficult excavation.
		Monitor conditions during and after construction.
		Employ tunnel excavation and lining techniques to ensure safety.
	Hazards related to oil and gas fields	Follow federal and state Occupational Safety and Health Administration regulatory requirements for excavations.
		Consult with other agencies such as the Department of Conservation's Division of Oil and Gas, or the Department of Toxic Substances Control regarding known areas of concern.
		Use safe and explosion-proof equipment during construction.

Duplicate

Resource Area	Impact Area	Mitigation Measure
		Test for gases regularly.
		Install monitoring systems and alarms in underground construction areas and facilities where subsurface gases are present.
		Install gas barrier systems.
Hydrology and water resources	Impacts on floodplains	Avoid or minimize construction of facilities within floodplains where feasible.
		Minimize the footprint of facilities within the floodplain through design changes or the use of aerial structures and tunnels.
		Restore the floodplain to its prior operation in instances where the floodplain is affected by construction.
	Impacts on surface waters	Use construction methods and facility designs to minimize the potential encroachments onto surface water resources.
		Minimize sediment transport caused by construction by following BMPs as part of NPDES and SWPPP requirements that will be included in construction permits. BMPs may include measures such as: a. providing permeable surfaces where feasible; b. retaining and treating stormwater on site using catch basins and filtering wet basins; c. minimizing the contact of construction materials, equipment, and maintenance supplies with stormwater; d. reducing erosion through soil stabilization, watering for dust control, installing perimeter silt fences, placing rice straw bales, and installing sediment basins; e. maintaining water quality by using infiltration systems, detention systems, retention systems, constructed wetland systems, filtration systems, biofiltration/bioretention systems, grass buffer strips, ponding areas, organic mulch layers, planting soil beds, sand beds, and vegetated systems such as swales and grass filter strips that are designed to convey and treat either fallow flow (swales) or sheetflow (filter strips) runoff.
		Use methods such as habitat restoration, reconstruction of habitat on site, and habitat replacement off site to minimize surface water quality impacts.
		Comply with mitigation measures included in permits issued under Sections 404 and 401 of the federal Clean Water Act.
		Comply with requirements in the SWPPP to reduce pollutants in storm water discharges and the potential for erosion and sedimentation.
		Comply with requirements of Section 10 of the federal Rivers and Harbors Act for work required around a water body designated as navigable and applicable permit requirements.
		Comply with the requirements of a state Streambed Alteration Agreement for work along the banks of various surface water bodies.
		Implement a spill prevention and emergency response plan to handle potential fuel or other spills.
		Where feasible, avoid significant development of facilities in areas that may have substantial erosion risk, including areas with erosive soils or steep slopes.
	Impacts on groundwater	Minimize development of facilities in areas that may have substantial groundwater discharge or affect recharge.
		Apply for, obtain, and comply with conditions of applicable waste discharge requirements as part of project-level review.
		Develop facility designs that are elevated, or at a minimum are permeable, and will not affect recharge potential where construction is required in areas of potentially substantial groundwater discharge or recharge.

Duplicate

Resource Area	Impact Area	Mitigation Measure
		Apply for and obtain a SWPPP for grading, with BMPs that will control release of contaminants near areas of surface water or groundwater recharge. BMPs may include constraining fueling and other sensitive activities to alternative locations, providing drip plans under some equipment, and providing daily checks of vehicle condition.
		Use and retain native materials with high infiltration potential at the ground surface in areas that are critical to infiltration for groundwater recharge.
Biological resources and wetlands	Impacts to sensitive vegetation communities (as defined at the project level)	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Use large diameter tunnels as part of the design to limit surface access needs in tunnels for ventilation or evacuation, as a method to avoid or limit impacts to vegetation and habitat above tunnels.
		Use in-line construction (i.e., use new rail infrastructure as it is built) to transport equipment to/from the construction site and to transport excavated material away from the construction to appropriate re-use or disposal sites to minimize impacts from construction access roads on vegetation/habitat.
		Accomplish necessary geologic exploration in sensitive areas by using helicopters to transport drilling equipment and for site restoration to minimize surface disruption.
		Use and reuse excavated materials within the confines of the project.
		Participate in or contribute to existing or proposed conservation banks or natural management areas, including possible acquisition, preservation, or restoration of habitats.
		Revegetate/restore impacted areas, with a preference for onsite mitigation over offsite, and with a preference for offsite mitigation within the same watershed or in close proximity to the impact where feasible.
		Comply with the Biological Resources Management Plan(s) developed or identified during project-level studies, as reviewed by the USFWS, CDFG, and USACE.
		Conduct preconstruction focused biological surveys.
		Conduct biological construction monitoring.
		Undertake plant relocation, seed collection, plant propagation, and outplanting at suitable mitigation sites.
		Prevent the spread of weeds during construction and operation by identifying areas with existing weed problems and measures to control traffic moving out of those areas such as cleaning construction vehicles or limiting the movement of fill.
	Impacts to wildlife movement corridors	Construct wildlife underpasses, bridges, and/or large culverts to facilitate known wildlife movement corridors.
		Ensure that wildlife crossings are of a design, shape, and size to be sufficiently attractive to encourage wildlife use.
		Provide appropriate vegetation to wildlife overcrossings and undercrossings to afford cover and other species requirements.
		Establish functional corridors to provide connectivity to protected land zoned for uses that provide wildlife permeability.

Resource Area	Impact Area	Mitigation Measure
		Design protective measures for wildlife movement corridors using the following process in consultation with resource agencies: a. identify the habitat areas the corridor is designed to connect; b. select several species of interest from the species present in the area; c. evaluate the relevant needs of each selected species; d. for each potential corridor, evaluate how the area will accommodate movement by each species of interest; e. draw the corridors on a map; and f. design a monitoring program.
		Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Use aerial structures or tunnels to allow for unhindered crossing by wildlife.
	Impacts to nonwetland jurisdictional waters	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Return degraded habitat to pre-existing conditions.
		Create new habitat by converting nonwetland habitats into wetland or other aquatic habitat.
		Enhance existing habitats by increasing one or more functions through activities such as plantings or nonnative vegetation eradication.
		Provide for passive revegetation by allowing a disturbed area to revegetate naturally.
		Purchase credits in an existing wetlands or aquatic habitat mitigation bank.
		Provide in-lieu fee payments to an agency or other entity who will provide aquatic habitat conservation or restoration.
		Prefer onsite mitigation over offsite mitigation, and for offsite mitigation, prefer that it be located within the same watershed or as close in proximity to the area of impact as possible.
	Impacts to wetlands	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Return degraded habitat to pre-existing conditions.
		Create new habitat by converting nonwetland habitats into wetland or other aquatic habitat.
		Enhance existing habitats by increasing one or more functions through activities such as plantings or nonnative vegetation eradication.
		Provide for passive revegetation by allowing a disturbed area to revegetate naturally.
		Purchase credits in an existing wetlands or aquatic habitat mitigation bank.
		Provide in-lieu fee payments to an agency or other entity who will provide aquatic habitat conservation or restoration.
		Develop and implement measures to address the "no net loss" policy for wetlands.
		Prefer onsite mitigation over offsite mitigation, and for offsite mitigation, prefer that it be located within the same watershed or as close in proximity to the area of impact as possible.
	Impacts to marine and anadromous fishery resources	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Comply with the terms of a Streambed Alteration Agreement for work along banks of surface water bodies.
		Implement a spill prevention and emergency response plan to handle potential fuel or other spills.
		Incorporate biofiltration swales to intercept runoff.

Duplicate

Resource Area	Impact Area	Mitigation Measure
		Where feasible, avoid significant development of facilities in areas that may have substantial erosion risk, including areas with erosive soils and steep slopes.
	Impacts to special status species	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Relocate sensitive species.
		Conduct preconstruction focused surveys.
		Conduct biological construction monitoring.
		Restore suitable breeding and foraging habitat.
		Purchase credits from an existing mitigation bank.
		Participate in an existing Habitat Conservation Plan.
		Phase construction around the breeding season.
Public parks and recreation resources	Impacts to parks and recreational resources	Continue to apply design practices to avoid impacts to park resources, and when avoidance cannot be accommodated, minimize the scale of the impact.
		Apply measures at the project level to reduce and minimize indirect/proximity impacts as appropriate for the particular sites affected, while avoiding other adverse impacts (e.g., visual), such as noise barriers, visual buffers, and landscaping.
		Apply measures to modify access to/egress from the recreational resource to reduce impacts to these resources.
		Design and construct cuts, fill, and aerial structures to avoid and minimize visual impacts to units of the state park system.
		Incorporate wildlife under- or overcrossings at appropriate intervals as necessary.
		Where public parklands acquired with public funds will be acquired for nonpark use as part of the HST system, commit as required by law to providing funds for the acquisition of substantially equivalent substitute parkland or to acquiring/providing substitute parkland of comparable characteristics for construction impacts.
		Restore affected parklands to natural state and replace or restore affected park facilities.
		If park facilities must be relocated, provide planning studies as well as appropriate design and replacement with minimal impact on park use.
		Use local native plants for revegetation.
		Develop and implement construction practices, including scheduling, to limit impacts to wildlife, wildlife corridors, and visitor use areas within public parks.
		For temporary unavoidable loss of park and recreation facility uses, consider providing compensation.
Cumulative	Impacts on traffic and circulation and travel conditions	The following program-level mitigation strategies can be developed, in consultation with state, federal, regional, and local governments and affected transit agencies, to improve the flow of intercity travel on the primary routes and access to the proposed stations or airports and would reduce this impact: 1. Regional strategies will include coordination with Regional Transportation planning and Intelligent Transportation System Strategies. 2. Local improvements could employ TSM/Signal Optimization; local spot widening of curves; and major intersection improvements.
		The following program-level mitigation strategies can be developed, in consultation with state, federal, regional, and local governments and affected transit agencies, to improve the flow of intercity travel on the primary routes and access to the proposed stations or airports and would reduce this impact: 1. Regional strategies would include coordination with Regional Transportation planning and Intelligent Transportation System Strategies. 2. Local improvements could employ TSM/Signal Optimization; local spot widening of curves; and major intersection improvements.

Duplicate

Resource Area	Impact Area	Mitigation Measure
	Impacts on air quality	The project-level mitigation strategies to address localized impacts can include the following and would reduce this impact: 1. Increase emission controls from power plants supplying power for the HST alignment. 2. Design the system to utilize energy efficient, state-of-the-art equipment. 3. Promote increased use of public transit, alternative fueled vehicles, and parking for carpools, bicycles, and other alternative transportation methods. 4. Alleviate traffic congestion around passenger station areas. 5. Minimize construction air emissions.
	Impacts on noise and vibration	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices emphasizing the use of tunnels or trenches. 2. Use of electric powered trains, higher quality track interface, and smaller, lighter, and more aerodynamic trainsets. 3. Full grade separations from all roadways.
		The project-level mitigation strategies include the following and would reduce this impact: 1. Treatments for insulation of buildings affected by noise and vibration. 2. Sound barrier walls within the right-of-way. 3. Track treatments to minimize train vibrations. 4. Construction mitigation.
	Impacts on land use and planning, communities and neighborhoods, property, and environmental justice	The program-level mitigation strategies for HST alignment contributions to the land use impacts include the following and would reduce this impact: 1. Design practices to maximize use of existing rights-of-way and incorporating strategies for stations to incorporate transit-oriented design. 2. Coordination with cities and counties in each region to ensure that project facilities will be consistent with land use planning processes and zoning ordinances.
	Impacts on agricultural lands	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices to avoid agricultural land conversion through maximizing use of existing rights-of-way to minimize encroachment on additional agricultural lands. 2. Utilizing aerial structure or tunnel alignments to allow for vehicular and pedestrian traffic access across the alignment. 3. Reducing the new right-of-way to 50 feet in constrained areas.
		The project-level mitigation strategies include the following and would reduce this impact: 1. Securing easements. 2. Participating in mitigation banks. 3. Increasing permanent protection of farmlands at the local planning level. 4. Coordinating with various local, regional, and state agencies support farmland conservation programs.
	Impacts on aesthetics and visual resources	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices that will incorporate local agency and community input during subsequent project-level environmental review in order to develop context sensitive aesthetic designs and treatments for infrastructure.

Duplicate

Resource Area	Impact Area	Mitigation Measure
		The project-level mitigation strategies include the following and would reduce this impact: 1. Design of facilities that integrate into landscape contexts, which will reduce potential view blockage, contrast with existing landscape settings, and light and shadow effects.
	Impacts on public utilities	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices that will avoid potential conflicts, at the project-level analysis, to the extent feasible and practical. These practices include design methods to avoid crossing or using utility rights-of-way by modifying both the horizontal and vertical profiles of proposed transportation improvements. Emphasis will be placed on detailed alignment design to avoid potential contribution to cumulative impacts from linear facilities on land use opportunities and to minimize conflicts with existing major fixed public utilities and supporting infrastructure facilities.
		The project-level mitigation strategies include the following and would reduce this impact: 1. Coordination with utility representatives during construction in the vicinity of critical infrastructure will occur.
	Impacts on cultural and paleontological resources	The program-level mitigation strategies include the following and would reduce this impact: 1. Continued consultation with SHPO will occur to define and describe general procedures to be applied in the future for fieldwork, method of analysis, and the development of specific mitigation measures to address effects and impacts to cultural resources, resulting in a programmatic agreement between the Authority, FRA, and SHPO. 2. Consultation with Native American tribes will occur.
		The project-level mitigation strategies include the following and would reduce this impact: 1. Avoidance measures through identification of sensitive resources within the project-level analysis, project design refinement, and careful selection of alignments. 2. Subsequent project-level field studies to verify the location of cultural resources will offer opportunities to avoid or minimize direct impacts on resources, based on the type of project, type of property, and impacts to the resource.
	Impacts on geology and soils	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices will be used while preparing extensive alignment studies to ensure that potential effects related to major geologic hazards such as major fault crossings, oil fields, and landslide areas will be avoided. 2. Mitigation for potential impacts will be developed on a site-specific basis, based on detailed geotechnical studies to address ground shaking, fault crossings, slope stability/landslides, areas of difficult excavation, hazards related to oil and gas fields, and mineral resources.
	Impacts on hydrology and water resources	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices to maximize use of existing rights-of-way to minimize potential impacts on water resources.

Duplicate

Resource Area	Impact Area	Mitigation Measure
		The project-level mitigation strategies include the following and would reduce this impact: 1. Avoidance and minimization measures will be incorporated into the development, design, and implementation phases. 2. Close coordination will occur with the regulatory agencies to develop specific design and construction standards for stream crossings, infrastructure setbacks, erosion control measures, sediment controlling excavation/fill practices, and other best management practices. 3. Mitigation strategies specific to reconstruction, restoration, or replacement of the resource will occur, in close coordination with state and federal resource agencies, related to flood plains; surface waters, runoff, and erosion; and groundwater.
	Impacts on biological resources and wetlands	The program-level mitigation strategies include the following and would reduce this impact: 1. Design practices to maximize use of existing rights-of-way to minimize potential impacts on biological resources and wetlands.
		The project-level mitigation strategies include the following and would reduce this impact: 1. Avoidance and minimization measures will be incorporated into the development, design, and implementation phases. 2. Close coordination will occur with the regulatory agencies to develop specific design and construction standards for stream crossings, infrastructure setbacks, monitoring during construction, and other best management practices. 3. Mitigation strategies specific to reconstruction, restoration, or replacement of the resource will occur, in close coordination with state and federal resource agencies, related to wetlands. 4. Field studies will be conducted to verify the location, in relation to the HST alignments, of sensitive habitat, wildlife movement corridors, and wetlands. These studies will provide further opportunities to minimize and avoid potential impacts on biological resources through changes to the alignment plan and profile in sensitive areas. For example, the inclusion of design features such as elevated track structures over drainages and wetland areas and wildlife movement corridors will minimize potential impacts to wildlife and sensitive species.
	Impacts on Section 4(f) and 6(f) resources (public parks and recreational resources)	The program-level mitigation strategies include the following and would reduce this impact: 1. Incorporation of sound barriers (e.g., walls, berms, or trenches), visual buffers/landscaping, and modification of transportation access to/egress from the public lands and recreational resource. 2. Incorporation of design modifications or controls on construction schedules, phasing, and activities.

Resource Area	Impact Area	Mitigation Measure
		The project-level mitigation strategies include the following and would reduce this impact: 1. Beautification measures. 2. Replacement of land or structures or their equivalents on or near their existing site(s). 3. Tunneling, cut and cover, and cut and fill of right-of-ways. 4. Treatment of embankments. 5. Planting, screening, creating wildlife corridors, acquisition of land for preservation, and installation of noise barriers. 6. Establishment of pedestrian or bicycle paths. 7. Other potential mitigation strategies identified during the public input process.
		In the event that HST alignments or facilities are located within or in close proximity to public parks, the following mitigations for natural, cultural, aesthetic, and recreational impacts may be considered to offset the contribution to the cumulative impact, including but not limited to: 1. Compensation for temporary and loss of park and recreation use. 2. Recordation of any historic features removed. 3. If necessary, provide alternative shuttle access service to park visitors. 4. Restore directly impacted park lands to a natural state. 5. If any facilities must be relocated, provide planning studies as well as design and appropriate replacement with minimal impact on park use. 6. Inventory and record affected historic structures. Provide appropriate mitigation for adverse effects to historic structures. 7. Require appropriate vehicle cleaning for all construction equipment used near units of the California State Park System to protect against spreading exotic plants or disease. 8. Use local native plants for revegetation. 9. Design and construct cuts, fills, and aerial structures to avoid and minimize visual impact to units of the State Park System. 10. In addressing impacts to wildlife movement corridors and habitat directly related to California State Park System units, consult with the California Department of Parks and Recreation. 11. Incorporate wildlife under- or overcrossings as necessary. 12. Adopt construction practices to protect critical wildlife corridors and visitor use areas within public parks.